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PAPER TRADE JOURNAL

Vol. XCVII NOVEMBER 23, 1933 No. 21

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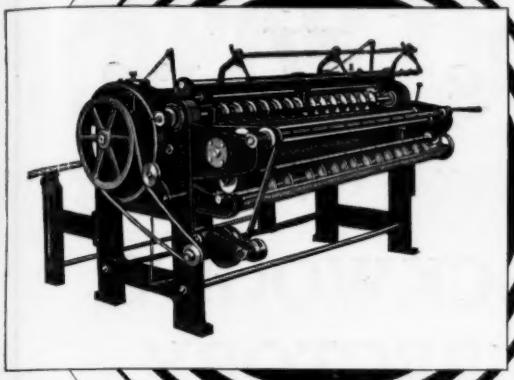
B. F. PERKINS & SON, INC. - ENGINEERS AND MANUFACTURERS - HOLYOKE, MASS., U. S. A.



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PAPER TRADE JOURNAL

ESTABLISHED 1872

SIXTY-SECOND YEAR

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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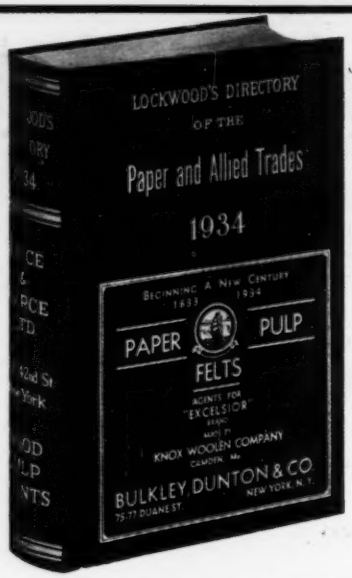

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PAPER TRADE JOURNAL

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PAPER

Vol. XCVII, No. 21 Thursday, November 23, 1933

Signs General Paper And News Print Codes

Both Codes Will Become Operative November 27—In Approving the Codes the President Stipulates that Public Hearings Be Held Within 90 Days to Determine the Adequacy of the Prescribed Minimum Wages—The General Paper Code is Expected to Increase the Total Pay Roll of the Industry to Approximately $170,000,000 Yearly.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 22, 1933—President Roosevelt an hour or so before leaving Washington for the South last Friday evening signed the paper and pulp and news print NRA codes which have been in his hands for almost two weeks. Both of the codes become effective on November 27.

In approving these two codes the President stipulated that within 90 days in each case public hearings are to be held to determine the adequacy of the prescribed minimum wages.

It has just become known that the question of wages delayed the signing. Even those "in the know" had believed all along that it was a question of either forestry or pulpwood that was keeping the President from signing these two codes. It now developes, however, that Secretary of Labor, Perkins, had been working on wages. Following is the official announcement made by NRA on both of these codes:

News Print Industry

A standard 40-hour week is provided for all but a small portion of the employees in this industry. To meet unusual conditions peculiar to the industry provision is made for a 40-hour week averaged over a 13 week period; with a limitation of 48 hours in any one week, with time and one-third for all hours worked in excess of 8 in a single day.

The basic minimum wage rate for mechanical workers is 38 cents per hour. Provision is also made for a 5-cent lower hourly average wage for women workers, but it is expressly provided that men and women doing the same work shall receive the same pay.

In his report to the President General Johnson pointed out that the News Print Industry is in a very serious condition. Consumption had fallen from 3,800,000 tons in 1929 to 2,800,000 tons in 1932. The capacity of mills in the United States is about 1,800,000 tons. In 1929 they produced 1,400,000 tons and in 1932 production was 1,008,000 tons. The price has fallen from $65 per ton, delivered, in 1929, to $40 per ton in 1933. It is doubtful, he continued, that even the most efficient mills can produce paper at this price in either Canada or the United States. In fact, five out of eight of the largest producers in the United States are in receivership, as well as practically all of the Canadian mills which are not supported by their affiliates. News print contracts are generally made for the calendar year and offerings for 1934 as low as $30 to $35 per ton, delivered, have been made by some Canadian mills.

In spite of this situation the News Print Industry has shortened its working hours from 48 to 40 and increased its wage rates substantially by the code. Employment will be increased about 10 per cent by the code, while the total increase in pay rolls is estimated at between 15 and 20 per cent.

Paper and Pulp Industry

A standard work week of 40 hours is provided, with the same proviso as in the News Print Code, that the 40 hours may be averaged over a 13-week period; with a limit of 48 hours in any one week, with time and one-third for hours worked in excess of 8 in a single day.

For wage purposes the country is divided into three zones—Northern, Central and Southern. A minimum wage of 38 cents an hour is provided for the Northern zone, 35 cents for the central zone and 30 cents for the Southern zone. The principal paper producing states in the Southern zone are Florida, Alabama, Mississippi, Louisiana, Arkansas and Texas, and in the Central zone Virginia, West Virginia, Tennessee and North Carolina. All the remaining important paper producing states are in the Northern zone. The wage differentials prescribed are much less than those now prevailing. Provision is made for a 5 cent lower wage for women, but it is expressly provided that where they do the same work they shall receive the same pay as men. The minimum wage prescribed for office workers ranges from $12 to $15 per week as in the President's Reemployment Agreement.

In his report to the President General Johnson stated that conditions vary greatly in different parts of the same zone and between different divisions of the industry as to the ability of the mills to increase wages. The wages prescribed are a fair compromise and in all cases represent a substantial increase over rates prevailing on October 1, but are slightly less than the rates now being paid by some of the better situated mills.

The normal number of employees in the industry is from 123,000 to 125,000. The number working in 1929 was 128,000. Owing to technological improvements, the number which would be required today to produce the 1929

(Continued on page 51)

Philadelphia Paper Market Continues Quiet

While Volume of Sales of Various Standard Grades of Paper Has Declined, Business Transacted Has Been of More Substantial Character—Credit Restriction Working Satisfactorily —Fine Paper Section Listless But Fairly Steady

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 20, 1933—Another quiet week among the paper distributors, but one of watchful waiting for what they believe is sure to come, rather than complaint over what is, has supplemented those immediately before in bringing down the net results of November business to a point where it is approximately from 10 to 15 per cent below the corresponding period of a month ago. On the face of this statistical statement it would appear that there has been retrogression. There has been from the viewpoint of numbers of sales and of aggregates involved, but there has been really the finest gain in the substantial character of the business done that the trade has enjoyed for a matter of years, since general decline first showed itself.

This perhaps anomalous condition is explainable by the radical steps taken on November 1 to establish by the united cooperation of every distributor a credit list which it is believed will almost entirely end losses through an unwise extension of credit. This week, as the previous one, brought such payments by consumers who were on the list as to quite substantially reduce the number still outstanding.

While, therefore, conditions in the fine paper industry are quiet and in slight recession it is worthy of note that the house employing perhaps the largest number of employees in this city—the aggregate is 160—has on its payrolls today just one more than it had in the good old days that have passed, and, moreover, the percentage of less income to them is considerably lower than the percentage reduction in money aggregate of business done.

In the paper stock branch of the business, there too maintains a condition of extreme quiet. Quotations are by no means firm, but for the best grades of fine, dry, high class packing there has been no further recession of prices, and while mill demand is not active, it is still sufficiently large to take these grades at the current rate of approximately $6.00 a ton where the dealers are willing to ship them. As a matter of fact, some of the dealers are storing up these better grades in the belief that it will benefit them to do so. At this basic price of $6.00 the comparison with the extreme low of the early part of the year of $3.50 a ton is somewhat comforting and it is believed that it represents the rock bottom under present conditions. When the basic rate was $3.50, stock dealers not only were unable to pay for stock from producers of it but where small amounts only were involved, were actually compelled to ask payment for its removal. The commonest packings are virtually a drug on the market, and these are of such low value it is not possible to store them for better prices. No large amounts, however, are coming into the warehouses, and all are being sent out as fast as they can be packed up.

Direct Mail Advertising Week

Because of the whole-hearted team work given by executives and salesmen of the Fine Paper Division of the Paper Trade of Philadelphia under the personal direction of President William A. Hentz, widespread publicity has been given to direct mail advertising week—November 20 to 24—under the auspices of the Poor Richard Club of Advertising men. Most active in assisting President Hentz have been Norbert A. Considine, president of the Paper House of Pennsylvania; George W. Ward, president, D. L. Ward & Company; Hubert Foster of the A. M. Collins Manufacturing Company, and W. R. Kortkamp, of Dill & Collins, Inc. Cooperating with the Poor Richard Club, in whose clubhouse, Juniper and Locust streets, a mammoth display is to be shown are the Philadelphia Club of Advertising Women, Eastern Industrial Advertisers Association, the Association of Advertising Agencies and allied groups of engravers, type setters and electrotypers. The mammoth display shown at the American Advertising Association's convention has been brought from Chicago and will be on display throughout the entire week. Tomorrow, there will be a luncheon at noon, devoted exclusively to the printing and allied trades; on Wednesday a luncheon to be known as Agency Day and to be conducted in the interest of direct mail from the agency standpoint; an evening session on Thursday especially for students, and on Friday a luncheon at which the speaker will be Grover Whalen, general manager of John Wanamaker, New York, who will speak on Selling under the NRA; and addresses by Eliot Wight, president D. M. A. A.; Charles R. Wiers, vice president DeLong Hook and Eye Company; William Wilson, sales promotion manager, National Carbon Company; Al. Harris, copy supervisor, N. W. Ayer & Son, Inc.; and Allan Brown, advertising manager, Bakelite Corporation.

Paper and Cordage Association Meets

The Paper and Cordage Association continued its activities during the week, and at its meeting at the Adelphia Hotel on Friday plans were formulated for a Christmas dinner to be given to from 75 to 100 poor children, recommended by the Salvation Army. The Christmas dinner is to be held on Friday, December 15, in the Crystal Ballroom of the Adelphia Hotel, with wives and sisters of the members acting as aides. Arthur Sherrill, paper broker, will furnish and participate in a quartette, singing Christmas carols; George K. Hooper, president of the Hooper Paper and Twine Company, will entertain at tap drum; Mr. Fitzgerald, of the Hummel Ross Fibre Paper Company, will recite, and each child will be furnished with wearing apparel, candy, fruit and toys. The association now ranks its membership rolls as revised to date as thoroughly representative of the industry in this city. It follows:

American Manufacturing Company, H. N. Newell, Front and Shunk streets;

American Writing Paper Company, F. W. Hastings, 406 Bourse Building;

Atlantic Gummed Paper Corporation, Frederick I. Brower, 910 Chestnut street;

Badger Paper Mills, Inc., 3120 St. Paul street, Baltimore, Md., O. Kai Madsen;

Better Packages, Walter W. Rolfe, 401 North Broad street;

G. A. Bossler, G. A. Bossler, 406 New street;

Buffalo Envelope Company, E. L. Richards, 401 North Broad street;

Denney Tag Company, H. S. Platt, Real Estate Trust Building;
Eastern Paper Company, L. C. Bartlett, 401 North Broad street;
Edwin H. Fitler Company, D. Crimmins, 517 Arch street;
J. E. Fricke Company, W. T. Clark, 40 North Front street;
Garrett-Buchanan Company, Ed. A. Keller, 18 South 6th street;
Grady-Travers Company, H. G. Kleinfelder, Jr., 210 South 4th street;
T. C. Hanna, 875 Drexel Building;
Hinde & Dauch Paper Company, Harry P. Johnson, 348 Drexel Building;
Hooper Paper and Twine Company, George K. Hooper, 105 Church street;
J. R. Howarth Paper Company, J. R. Howarth, Jr., 804 Sansom street;
Hummel-Ross Fibre Company, L. Fitzgerald, Drexel Building;
International Paper Company, D. N. Newell, Ledger Building;
Kalamazoo Vegetable Parchment Company, W. E. Swan, Drexel Building;
E. Latimer, Jr., 126 North 4th street;
Paper Manufacturing Company, V. A. Dirvin, 5th and Willow streets;
Peerless Paper Company, I. J. Sheppard, Oaks, Montgomery County, Pa.;
Pejepscot Paper Company, Arthur Schroeder, 42 Broadway, New York;
Quaker City Paper Company, R. S. Reed, 307 Vine street;
Satterthwaite-Cobaugh Company, H. Satterthwaite, 217 Chestnut street;
Saxe Paper Company, Nathaniel Saxe, 320 Race street;
Schuylkill Paper Company, Frederic Balch, 437 Chestnut street;
A. B. Sherrill, Lafayette Building;
Menasha Products Company, Geo. W. Sherburne, 1528 Walnut street;
Shryock Brothers, 924 Cherry street;
J. L. N. Smythe Company, Stanleigh C. Brower, 32 South 6th street;
Temple Paper Company, Daniel J. Troy, 425 North 40th street;
Terminal Paper Company, Cecil Bently, 401 North Broad street;
Union Bag and Paper Company, W. H. Stark, 401 North Broad street;
S. Walter, Inc., H. Lefkowitz, 144 North 5th street;
D. L. Ward Company, Geo. W. Ward, 401 North Broad street;
Wheeler Paper Corporation, Martin A. Mutz, 6344 City Line;
Whiting-Patterson Company, A. E. Whiting, 320 North 13th street;
Wilcox-Walter-Furlong, 17 South 6th street, W. G. Wilcox;
Wilder Bros. Company, C. A. Wilder, 12th and Brown streets;
Frank W. Winne & Son, Inc., Amos M. Coath, 44 North Front street.

Paper and Bag Dinner

And finally the Paper and Bag Division of the Paper Trade Association also was active during the week, holding its first annual stag dinner at the Broadwood Hotel with more than one hundred in attendance. In addition to general sociability, the purpose of the meeting was to get together in order to bring the smaller houses in closer touch with the larger ones, and it is felt that this objective was realized. Speakers included Simon Walter, head of S. Walter Company; William Starke, Union Bag Company; Charles F. Klefeker, of Bloomer Bros., Newark, N. J.; and Charles Resnick, chairman of Paper and Bag Division. Hoxie's Harmonica Band furnished the entertainment. Frank Dubin was chairman of the entertainment committee.

Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 22, 1933—The Government printing Office has received the following bids for 71,750 pounds of 32 x 42 white sulphite writing paper: Aetna Paper Company, at 4.83 cents per pound; Cauthorne Paper Company, 4.67 cents; Old Dominion Paper Company, 4.68 cents; Perkins-Goodwin Company, 4.485 cents; Whitaker Paper Company, 5.15 cents; R. P. Andrews Paper Company, 4.69 cents; Barton, Duer & Koch Paper Company, 5.22 cents.

Only one bid was received for 50,000 pounds of manila calendered tag board and that was from Barton, Duer & Koch Paper Company, at 6.5 cents per pound.

The Government Printing Office has received the following bids for 168,000 pounds of mimeograph paper: Barton, Duer & Koch Paper Company, at 4.92 cents per pound; Aetna Paper Company, 4.93 cents; Dill & Collins, Inc., 6.2 cents; Corril A. Hubbard, 6.25 cents; Perkins-Goodwin Company, 5.1 cents; R. P. Andrews Paper Company, 6.72 cents; Whitaker Paper Company, 5.44 cents; Reese & Reese, Inc., 5.86 cents; and Mathers-Lamm Paper Company, 9.307 cents.

The following bids were also received for 15,000 sheets of white cloth lined paper: Mathers-Lamm Paper Company, $101.30, $79.11, $82.28, and $104.41 per M sheets; Lindemeyr Paper Company, $101.83, $79.66, $82.93, $105.00 and $102.10; Charles G. Stott & Co., Inc., $120.43; Whitaker Paper Company, $104.60; R. P. Andrews Paper Company, $83.12, $86.45, $106.40, and $106.68; Reese & Reese, Inc., $106.60; Walker-Goulard-Plehn Company, $106.40, $83.12, $86.45, $109.73 less 2 per cent; Barton, Duer & Koch Paper Company, $103.00; and Old Dominion Paper Company, $105.98.

Superintendents To Meet at South Poland

The Fifteenth annual convention of The American Pulp and Paper Mill Superintendents Association, Inc. will be held in the Poland Spring House, South Poland, Maine, on June 20, 21, 22, 1934.

K. E. Terry of the S. D. Warren Company, Cumberland Mills, Maine, will be General Chairman, assisted by Luther Parkman of the same company.

The annual golf tournament will be held on the hotel links immediately adjoining the hotel, on Wednesday, June 20th.

Eastern Paper Salesmen Meet

There was an excellent attendance at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, held at the Hotel Woodstock, New York, on Monday last.

Dr. E. O. Merchant, secretary of the Ground Wood Paper Association, reviewed the business outlook as presented at the recent Harvard Conference; while R. S. Kellogg, secretary of the News Print Service Bureau, discussed the News Print Code.

Toronto Paper Market Conditions Are Spotty

Demand for Various Standard Grades of Paper Generally Listless—Coarse Wrapping Paper Moving Slowly—Fine Paper Manufacturing Operations Light—Coated Paper Mill Activities Below Normal—Envelope Business More Active.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 20, 1933—The month so far has yielded only a moderate amount of business in wholesale paper circles in Ontario and the market generally may be described as spotty. Fine paper mills are not any too busy and in the case of the coated mills business is decidedly dull with manufacturing activities at as low an ebb as they have been at any time during the year. This means that the demand is still for the cheaper grades of paper which are going into advertising and direct mail pieces in keeping with the trend of business with the printing trade. Printers, for the most part, are quiet and the consumption of paper by them is chiefly the cheaper classes, although the lithographing branch is doing fairly well and is using some of the better paper grades. In both the mills and the distributing houses coarse papers are moving slowly and the same may be said of paper bags, with the exception of flour sacks, which is enjoying quite a good demand. Business has picked up slightly with the envelope manufacturers but the volume of turnover in that line is anything but normal. Manufacturing stationers are still suffering from lack of orders and blank books and general stationery lines have not moved at all well during the past year. Specialty lines of paper seem to be the only class of the paper trade just now that is enjoying real activity. Glassine, grease proof and waxing lines are moving well and there has been considerable improvement in the tissue paper field, with light weight papers generally registering gains over last month. There is quite a good demand for tissues, toilets and other specialty light weight paper lines. While demand for waste paper from the board mills was strong last month, it was only mediocre from the book mills, and the market at the moment is quiet with supplies about commensurate with demand.

The production of pulpwood is extremely light, and in Ontario, at any rate, the market seems practically denuded of stock. There is still evidence of quite a sizeable demand from the mills, however, and there have been numerous enquiries for supplies.

Bright Outlook for Restigouche Co.

According to word from St. John, N. B., a transformation has taken place in operations of the Restigouche Company, Ltd., subsidiary of Fraser Companies, Ltd., during recent months. The mill at Athol, N. B., has been operating on a 24-hour, seven days a week, basis for some time and it is learned that the company has been during the past several months operating at a profit, after making allowance for depreciation, depletion, and proportion of bond interest. The company, it is understood, has contracted for the entire 1934 output of its Athol mill, which has a daily capacity of 150 tons of sulphite pulp. Wood requirements for this year have been entirely cut, and work has been started on cutting for its 1935 requirements. While the market for all grades of wood pulp has been very much better since Spring of this year, especially in standard sulphate, which has heretofore been the chief product of the Restigouche mill, the most important factor in the wide change for the better that has taken place in the fortunes of the company is that large and expanding contracts for rayon pulp have been forthcoming. Rayon pulp production for which costs are only slightly in excess of those for standard pulp, commands a price from $15 to $20 a ton higher. Thus the wide expansion in the proportion of rayon pulp produced at the mill has been providing the Restigouche company with a materially increased operating profit. Further contracts for rayon pulp have been obtained, or are assured for the coming year, and indications are that around 75 per cent of the company's production and sales in 1934 will represent rayon pulp. On the basis of 75 per cent rayon pulp sales in 1934, operating profits of the Restigouche company for that year are estimated at more than $1,000,000 and, after deduction for bond and bank interest and appropriation for depreciation and depletion on the same basis as in 1932, net earnings for the year of approximately $400,000 would be indicated. This would pave the way for starting payment of full interest charges on its big loan with Fraser Companies, and also to begin liquidation of the loan.

More Power From Abitibi in Sale Deal

The chairman of the Hydro-Electric Power Commission of Ontario has announced the execution of an agreement with the Canadian Northern Power Company to purchase from the Commission all such additional power as is required by the company to take care of its demands for the next ten years. This means that the company will take from the Hydro what is needed to take care of its commitments beyond the power it is receiving from its own developments in Northern Ontario and Northern Quebec. The supply will come from the Abitibi Canyon development which was taken over by the provincial government from the Abitibi Power and Paper Company. The Canyon development is owned by the province and operated on its behalf by the Hydro-Electric Power Commission. It forms no part of the municipal systems set up under the Power Commission Act.

Provincial to Use Power for Boilers

A large proportion of the sum of approximately $16,000 paid annually by Provincial Paper, Ltd., to United States coal dealers will be diverted to the treasury of the Ontario Hydro-Electric Power Commission. Instead of coal, electricity will be used for the steam boilers, the power coming from the Nipigon River development. Hitherto some 30,000 tons of soft coal per year has been used for the purpose.

Champion Co. Declares Dividend

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, November 17, 1933—The directors of the Champion Coated Paper Company have declared the regular quarterly dividend of 25 cents on common, payable November 15, to stockholders of record November 10. The regular quarterly dividends of $1.75 on the first preferred and special preferred stocks were ordered paid January 2, to record of December 20.

The quarterly dividend of $1.75 on the preferred stock of the Champion Fibre Company is payable January 2, record December 20.

Activities of Fox River Valley Paper Mills

Milwaukee Lace Paper Co. Leases Additional 60,000 Sq. Ft. of Floor Space for Storage and Shipping—New Unit Equipped With Electric Hoisting Machinery and Adequate Side Track Facilities—Added Quarters Will Speed Up Shipments.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 20, 1933.—Need of additional floor space to take care of expanding volume has caused the Milwaukee Lace Paper Company to lease part of the Albert Trostel & Sons Company building at 1776 North Commerce street, Milwaukee. The additional unit will provide 60,000 square feet of floor space, to be used for storage and shipping. The building is equipped with electric hoisting machinery and adequate side track facilities. These added quarters will speed up shipments to the company's branch warehouses in New York and Los Angeles.

Forest Conservation Efforts

Wisconsin's vast forest areas are becoming more of a potentiality from year to year as a pulpwood source due to the combined efforts of the United States Forestry Department and the Wisconsin Conservation Commission. What a few years ago appeared to be the disintegration of the wood and timber supply is now an organized movement to conserve what is in existence and to perpetuate the supply for future needs by replanting and cultivation.

Re-employment programs of both the state and nation have done much to bring about this reversal of attitude towards the forests, and to correct the belief that the supply of merchantable timber would be extinct in a few years. The glaring need of constructive forestry effort presented just the right kind of opportunity to provide a large amount of useful work to those receiving public aid, work that is mostly hand labor spread over a liberal number of men. The speed with which the forestry program has been developed is beyond any vestige of what seemed to be possible a few years ago.

Large areas have been added to the federal forest reserves and the state of Wisconsin has engaged in like expansion. Counties are also taking over tax delinquent lands adapted to reforestation and are maintaining them for the future.

Thousands of men are now at work in the state putting most of the forest area on a scientific cultivation basis, building roads and fire lanes, removing slash and improving the fire detection and fighting system. Within the next two or three weeks, the Wisconsin Conservation Commission will provide forestry jobs for 8,100 additional men now on public relief rolls. Some will be given work near their homes; others will be placed in camps.

Wisconsin now furnishes only a small amount of the pulpwood needed for its own mills, obtaining its supply largely from northern Michigan and Canada. It is believed, however, that eventually the state will recover from its slashing down process, and that by scientific cultivation and selective cutting, a permanent supply of wood will be assured.

Lake States Technical Experts Meet

Two speakers presented interesting addresses at the monthly meeting of the Lake States Section of the Technical Association of the Pulp and Paper Industry at Conway Hotel, Appleton, Wis., November 14. Seventy-five were present at the dinner.

G. E. Landt, chief chemist for the Continental-Diamond Fibre Company, Newark, N. J., spoke on "Reduction of Corrosion and Wear by Use of Laminated Resinous Machine Parts." H. B. Johnson, engineer with the Link Belt Company, Chicago, spoke on "Chains, Conveyors and Elevators and Their Application in Pulp and Paper Mills." R. J. LeRoux, chairman of the division, was in charge of the program.

News of the Industry

Dr. Harry F. Lewis, professor of organic chemistry at the Institute of Paper Chemistry at Lawrence College, Appleton, Wis., is making a trip east to fill speaking engagements. He will appear on the program of the Cleveland and Erie sections of the American Chemical Society meeting at Cleveland November 22 and 23, and before the students of pulp and paper and wood technologists at the New York State College of Forestry at Syracuse, N. Y., November 24. His subject at the chemistry meeting will be "Changes in the Structure of Papermaking Fibres during Swelling."

The Northeast Wisconsin section of the American Chemical Society was to meet at the Institute of Paper Chemistry at Appleton November 21, with Dr. James A. Laurie as the principal speaker. He is research engineer for the A. O. Smith Corporation, Milwaukee, Wis.

After unloading 2,500 tons of coal at the dock of the Hoskin-Morainville Paper Company, Marinette, Wis., last week, the freighter *F. J. Schoellkopf,* of the American Steamship Company, ran aground when backing out of the river basin. She still carried 6,000 tons of coal consigned to Green Bay. The craft was liberated by the coast guard cutter *Escanaba.*

Start Second Machine at Carthage

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., November 20, 1933—Virtually all the business men of this place were in attendance last week at the opening of the large paper machine at the mill of the Carthage Paper Makers which had not been operated since 1929. Announcement was made, however, that although the machine had been fully reconditioned it will not be used in the production of paper until the new roof to the plant is completed. During the past week a banquet was served in the mill at which the entire staff participated. Soon afterward the entire group was brought into the mill where the large machine was turned on for several minutes by officials of the company. The mill is being operated as a cooperative venture and was leased from the Carthage Pulp and Board Company. Many local residents are being employed and operation of the plant has been very successful from the start several months ago.

The placing in operation of the larger of the two machines climaxes a major step in the successful operation of the mill of the newly organized concern. For the past several months the smaller of the two machines has been conducted on a profitable basis and the decision to repair the larger machine was made recently in order that an expansion in business could be perfected.

Boston Paper Trade Association Meets

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, MASS., November 20, 1933—With Frederick N. Blodgett of the First National Bank of Boston speaker of the evening, relating his experiences—"Alaska and the Kodiak Bear by Airplane"—the fall meeting of the Boston Paper Trade Association at the Exchange Club Wednesday evening was one of the most entertaining ever held. The setting, in fact, on the wall of the dining room, was one of bearskins and bear heads, trophies of the hunt, brought down by H. W. Webster, one of the managers of Hubert L. Carter's estate in New Hampshire, who went on a trip to Alaska last year. Large ruddy apples, called the "Wealthy," were at each plate, the gift of Horace A. Moses, president of the Strathmore Paper Company, West Springfield, Massachusetts, to whom a vote of hearty thanks was given.

In the business meeting, with President Charles A. Esty presiding, F. Bendel Tracy was chosen secretary pro tem, in the absence of Secretary John L. Hobson who was in New York, working on the news print code. The following were elected to regular membership: R. B. McDougall, Collings Manufacturing Company, proposed by Charles A. Esty and James Campbell, Industrial Paper and Cordage Company, proposed by Charles W. Fields, and to limited membership, Ernest S. Reid, Crystal Tissue Company, proposed by F. Bendel Tracy. The chair appointed the following as a nominating committee to bring in names of officers to be voted on at the March meeting: C. S. Proctor, Charles Baird, John E. A. Hussey, M. L. Madden and J. W. Vivian.

F. L. Blodgett Relates Experiences

President Esty then introduced the speaker of the evening. Mr. Blodgett said that two or three years ago he and a friend took a trip to Alaska in a gypsy moth plane, weighing 1,200 pounds, which they named "The Flit." Neither he nor his companion, who was Lawrence M. Lombard, knew much about operating an airplane, having had only about four hours instruction before leaving. Mr. Blodgett explained that in a month's vacation, he wanted to hunt the kodiak bear in Alaska and that as much time would be consumed in going the ordinary way, he decided to go by plane. He learned how to start and stop the motor, how to oil and take care of the valves and change spark plugs. In the 14,000 miles a spark plug went bad only once. He took along a moving picture camera and "Larry" brought a marine compass from his boat as a guide.

Mr. Blodgett's story was fraught with experiences, both amusing and thrilling. Their first landing place was Schnectady, where they were having the annual air circus. Over Bliss, Idaho, they ran out of oil and had to come down very quickly. They hit irrigation ditches, but had plenty of help from the people of the town and with the aid of a horse, got out. While going over the Rockies, just before they came to Salt Lake City, they ran into a thunderstorm, in which the currents of air took the plane up quickly and then down again. They finally came through unharmed. Mr. Blodgett digressed a moment and said that on the way back, at Lindbergh Field, Cal., he met Ruth Alexander, who was using a beautiful white monoplane and was trying to break the Trans-Continental record to Wichita, Kans., and was afterwards killed while on the trip.

Adventures in Alaska

Finally they reached Alaska and went to Admiralty Island, south of Juneau, where they found an old man, to whom they had been directed, named Allen Hasselborg. The old man lived alone on the island and had hunted bear. He said "the durned things are so thick I nearly stumble over them." The two went on trips with Hasselborg, and shot at some bears, hit some and just watched others. The old man, Mr. Blodgett said, was one of the most interesting he had ever met. His philosophy of life was the survival of the fittest, and he had three strong dislikes, the government, liquor and women. He had a companion once, but the bears killed him. Then he had another, with whom he didn't get on very well. They didn't speak for 32 days and one day he thought his companion was going to shoot him and he had to tell him to get out, and since then he hadn't wanted a companion. In their travels they saw 16 bears in all. The kodiak bear is the biggest member of the bear family and ranks about fifth in intelligence among animals. The salmon were very thick in the streams, so thick that the water was actually filled with them. Occasionally they would leap into the air. The method of catching them was with a rod and line and a bare hook. Just cast the hook into the water and catch a salmon by his body anywhere. The pictures that were thrown on the screen and which followed Mr. Blodgett's talk showed fishing by this method, and also included a bear fishing. Several highly interesting reels were shown, which included the picture of a bear they had shot.

Officers of the Association

Officers of the Association are as follows: President, Charles A. Esty; First Vice-President, Frederic W. Main; Second Vice-President, F. Bendel Tracy; Treasurer, T. Charles Casey; Secretary, John L. Hobson.

Those Present

Those present included the following: Charles A. Esty, Frederick N. Blodgett, F. W. Main, N. Harrower, Hubert L. Carter, H. R. Woodward, Edward B. Dik, Arthur M. Burr, Walter P. Simonds, J. Gilbert Swift, Jr., L. M. Turner, Howard E. Chase, J. G. Swift, A. W. Middleton, Percy E. Weston, Paul S. Fiske, C. Frederic Wellington, E. P. Hay, R. P. Teele, Wm. W. Jenks, K. H. Ways, T. K. Davis, L. H. Young, John E. Roach, Wm. C. Ross, Ernest S. Reid, F. Bendel Tracy, Frank B. Cummings, John Kelly, C. E. Rice, Walker B. Holmes, Nathan S. Clark, L. A. Walden, J. R. Whitney, Charles J. O'Brien, William N. Marshall, E. W. Pierce, C. H. Dodge, H. A. Lindenberg, H. C. Ham, J. J. O'Brien, E. S. Clark, Charles S. Proctor, John E. A. Hussey, Charles W. Fields, S. W. Bartlett, Harry R. Birt, H. A. Hall, E. H. Little, Leon M. Poore, Gordon Blanchard, R. B. McDougall, H. C. Thayer, Wendell A. Allen, Harold C. Upham, W. Gardner Very, J. W. Vivian, W. E. Porter, Jr., William Ross, Don Brown, C. W. Townsend, C. W. Nelson, W. H. Hilton, W. N. Stetson, Jr., Fred B. Korbel J. H. Brewer, Constant Southworth, E. R. Lyman, H. F. Bigelow, N. A. Park, E. L. Wood, W. J. McLellan, Jas. A. Moses, Adams Carter, H. W. Webster, A. P. Mitchell, Frank C. Cate, Frank H. Merrill, W. W. Binford, T. Charles Casey and, E. Lindsey Cummings.

General Code of Fair Competition for the Paper and Pulp Industry

The following is the text of the General Code of Fair Competition for the Paper and Pulp Industry as signed by President Roosevelt Friday, November 17.

To effectuate the policies of Title I of the National Industrial Recovery Act the following is hereby established as a Code of Fair Competition for the Paper and Pulp Industry, and shall be binding on every member thereof.

Article I—Definitions

1. Where used in this Code and in all codes subordinate hereto, the following definitions shall apply:

"Industry"—The manufacture in the United States from pulpwood, wood pulp or other stock or pulp, of all paper (except such paper now in regular use in the making of daily newspapers as is specifically mentioned and described in Schedule "A" hereof), such paperboard as is listed in Schedule "B" attached, and pulp; provided, however, that if and when the provisions of this Code shall be extended to cover any products of converters of paper and paperboard, then the word "Industry" shall include the manufacture of same.

"Member"—A natural person, partnership, association, corporation, trust, trustee, trustee in bankruptcy or receiver engaged in such industry.

"Division"—A division or section of the industry recognized as such by this Code.

"Act"—Title I of the National Industrial Recovery Act.

"Administration"—The National Industrial Recovery Administration.

"Administrator"—The National Industrial Recovery Administrator.

Article II—Organization

1. The Executive Committee of the American Paper and Pulp Association is hereby designated as the Agency for administering the provisions of this Code and is hereby named and is hereinafter referred to as "The Paper Industry Authority." The Administrator may designate three persons as additional advisory members thereof; the member or members so designated shall have no vote but in all other respects shall be members of the said Paper Industry Authority.

2. The Industry is hereby divided into divisions as set forth in Schedule C hereto attached. Any question as to the division into which any particular grade, class or kind of paper, paperboard or pulp or any product of conversion of any of them may fall, shall be determined by the Paper Industry Authority.

In the event that the jurisdiction of the Code shall be extended to cover the manufacture of products which do not fall within any such division, the Paper Industry Authority may create new divisions to include such products, and the members of such divisions may then adopt and submit divisional codes as provided in Article III hereof.

The Paper Industry Authority may create new divisions by the subdivision of any of such divisions or by the consolidation of any two or more of such divisions, provided, however, that no such subdivision or consolidation shall be made without the consent of the divisional association of each division affected thereby.

3. In each division there may be one divisional association to which every member of the industry engaged in the manufacture of any product included in such division shall be eligible for membership. Each such divisional association shall be eligible for membership in the American Paper and Pulp Association.

4. The expenses of administering this Code shall be apportioned among the various divisions in accordance with a formula to be adopted by the Paper Industry Authority. The expenses of administering the subordinate Code of each Division, together with the proportion of the expense of administering this Code, allocated to such Division, shall be borne pro rata in accordance with a formula to be adopted by the Executive Authority of such Division by all members of such Division who accept the benefits of the Paper Industry Authority and/or the Executive Authority of such Division or otherwise assent to this Code. Divisional Associations shall be responsible for the payment of all Code administration expense.

Article III—Divisional Codes

1. Each such divisional association may adopt a divisional code and may either submit the same as a supplement to this Code for the approval of the President of the United States, or may submit the same subsequently through the Paper Industry Authority to the President for his approval. Such divisional codes, when so approved, shall have the same force and effect as to the divisions of the industry affected thereby as this Code.

2. Such divisional codes shall be subordinate to this Code and shall specifically recognize this Code as applicable to all members of the industry engaged in manufacturing products falling within the division for which such divisional code is submitted.

3. Pending action by the Paper Industry Authority each division shall include such grades, classes and kinds of paper, paperboard or pulp as are generally recognized by custom as falling within the classification indicated by the name of such division.

4. Each such divisional code shall designate an agency for the purpose of administering such divisional code which shall be denominated "The Executive Authority" of such division.

5. Such divisional codes may contain such provisions relating to said division as may be appropriate for inclusion in a Code of Fair Competition under the Act, provided that no such code shall contain any provision contrary to or inconsistent with the provisions of this Code.

Article IV—Hours of Labor

1. Employees in the industry shall not be required or permitted to work hours in excess of the limits prescribed in the following schedule:

SCHEDULE OF WORKING HOURS

(A) Watchmen:

Eight (8) hours in any one day and fifty-six (56) hours in any one week.

(B) Chauffeurs, truckmen, switching crews, engineers, firemen and electric and hydro-electric operators, and filter plant employees:

One hundred sixty-eight (168) hours in any period of four consecutive weeks, but no more than ten (10) hours in any one day and forty-eight (48) hours in any one week.

(C) Tour-workers in continuous process operations:

Eight (8) hours in any one day and an average of forty (40) hours per week in any period of thirteen (13) consecutive weeks; provided, however, that additional hours may be worked:

(1) To avoid a shut-down due to the temporary absence of a relief worker.

(2) In changing wires and machine clothing, and

(3) In clean ups, wash ups, and ordinary repairs and adjustments in cases where a machine is shut down for a period of not less than eight (8) consecutive hours.

(D) All other laborers, mechanical workers or artisans employed in any plant, mill or factory or on work connected with the operation of any such plant, mill or factory:

An average of not more than forty (40) hours per week in any period of thirteen (13) consecutive weeks but not more than forty-eight (48) hours in any one week; provided, however, that time worked in excess of eight (8) hours in any one day shall be paid for at not less than time and one-third.

(E) Executives and their personal secretaries and other employees regularly engaged in a supervisory capacity, receiving thirty-five dollars ($35) or more per week, and outside salesmen: No limitations.

(F) All other employees:

An average of forty (40) hours per week in any calendar year and an average of not to exceed forty-eight (48) hours per week in any period of thirteen (13) consecutive weeks.

Provided, however, that no limitation on hours of work contained in said schedule shall apply to employees of any class when engaged in emergency repairs or emergency maintenance work involving breakdowns or protection of life and property.

2. At such intervals as the Paper Authority shall prescribe, every member shall report to the Paper Industry Authority:

(A) The number of man-hours worked under subdivision C (1), C (2) and C (3) of said schedule and the ratio which said man-hours bear to the total number of man-hours of labor under subdivision C; and

(B) Shall furnish the Paper Industry Authority such information as it may require in order to enable it to determine whether the limitations contained in said schedule have been exceeded.

3. No employee shall be permitted to work for more than one member of the Industry an aggregate number of hours in excess of the number prescribed in said schedule.

Article V—Wages

1. The minimum rate of wage of any laborer, mechanical worker or artisan employed in any plant, mill or factory or on work connected with the operation of any such plant, mill or factory shall be as follows:

(A) Northern Zone, which shall consist of all of the territory of the United States except the States named in subdivisions (B) and (C):

Male: Thirty-eight (38) cents per hour.

Female: Thirty-three (33)cents per hour.

(B) Central Zone, which shall consist of the States of Delaware, Maryland, Virginia, West Virginia, Kentucky, Tennessee and North Carolina, and the District of Columbia:

Male: Thirty-five (35) cents per hour.

Female: Thirty (30) cents per hour.

(3) Southern Zone, which shall consist of the States of South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas and Texas:

Thirty (30) cents per hour.

Provided, however, that in the case the rate per hour for any class of labor was, on July 15, 1929, less than the minimum rate above specified for the same class of labor, then the minimum rate for such class of labor shall be the rate paid on July 15, 1929, but in no event less than ninety (90%) per cent of the rate above specified.

2. The Paper Industry Authority shall obtain statistical data concerning the effect of the above proviso on wage rates in the Industry and shall within ninety (90) days after the effective date of this Code make a report thereon to the Administrator.

3. Where a State law provides a higher minimum wage than is provided in this Code, no person employed within such State shall be paid a wage below that required by such State law.

4. Pieceworkers shall be paid at rates which will yield a worker for an hour's work not less than the minimum rate prescribed.

5. The minimum rates of wages for all other employees except commission salesmen, shall be as follows:

Not less than fifteen dollars ($15) per week in any city of over 500,000 population, nor less than fourteen dollars and fifty cents ($14.50) per week in any city between 250,000 and 500,000 population, nor less than fourteen dollars ($14) per week in any city between 2,500 and 250,000 population, nor less than twelve dollars ($12) per week in towns of less than 2,500 population.

6. The minimum wages hereby prescribed shall not in any way be considered as a discrimination by reason of sex and where, in any case, women do substantially the same work or perform substantially the same duties under the same conditions as men they shall receive the same rate of wages as men receive for doing such work or performing such duties. The Paper Industry Authority shall prepare and file with the Administrator, ninety (90) days after the effective date of this Code, a description of all occupations in the industry in which women are employed.

7. The wage rates of all employees receiving more than the minimum rates herein prescribed shall be reviewed and such adjustments, if any, made therein as are equitable in the light of all the circumstances, and within ninety (90) days after the effective date hereof, the Paper Industry Authority shall report to the Administrator the action taken by all members of the industry under this Section.

8. A person whose earning capacity is limited because of physical or mental defect, age, or other infirmity, may be employed on light work at not less than eighty per cent (80%) of the minimum wage prescribed in Section 1 hereof, if the State Authority designated by the United States Department of Labor shall have issued a certificate authorizing the employment of such person on such basis, provided, however, that the total number of such employees in any one plant shall not exceed three per cent (3%) of the total employees in such plant. So much of this Section as requires the issuance of such a certificate shall not take effect until sixty (60) days after the effective date of this Code.

Article VI—General Labor Provisions

1. No person under sixteen (16) years of age shall be employed in the industry nor anyone under eighteen (18) years of age at operations or occupations hazardous in nature or detrimental to health. The Paper Industry Authority shall submit to the Administrator within sixty (60) days after the effective date of this Code a list of such occupations. In any State an employer shall be

deemed to have complied with this provision if he shall have on file a certificate or permit duly issued by the authority in such State empowered to issue employment or age certificates or permits, showing that the employee is of the required age.

2. Employees shall have the right to organize and bargain collectively through representatives of their own choosing and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection. No employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing. Employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President.

3. Labor agreements now in force between members and their employees shall be affected only by such provisions of this Code as may prescribe higher wages and shorter hours than are provided for in such agreements.

4. Employers shall not reclassify employees or duties of occupations performed by employees so as to defeat the purpose of the Act.

5. All employers shall post full copies of this Code in conspicuous places accessible to employees.

6. Standards for safety and health shall be submitted by the Paper Industry Authority to the Aministrator within six (6) months after the effective date of this Code.

Article VII—Accounting-Selling

1. The Paper Industry Authority shall, as soon as practicable, propose a standard method of accounting and costing for the industry and submit the same to the Administrator. When it shall have been approved by the Administrator, every member shall use an accounting and costing system which conforms to the principles of, and is at least as detailed and complete as, such standard methods.

2. Each member shall, on or before thirty (30) days after the effective date of this Code, file with the Executive Authority of his division, or divisions, complete schedules in such form as such Executive Authority shall prescribe of prices and terms and conditions of sale for domestic consumption (including all differentials, discounts, trade allowances and special charges) of all products falling within the scope of the division offered for sale by such member, and shall so file all subsequent changes therein or revisions thereof at least twenty-four (24) hours prior to the effective date of any such changes or revisions. When any member shall file any such schedule of prices, or any revision thereof, any other member may also file a revision of its own schedules and if such other member shall so desire and state therein, the same shall be effective as of the same date as the schedule or revision thereof first in this sentence referred to. Each such schedule of prices shall conform to all trade practices and other provisions established in and by this Code or any pertinent subordinate code or any amendment or supplement to this Code or to such subordinate code. The Executive Authority shall send to the Paper Industry Authority and to each member of the division and to any others concerned requesting a copy thereof, a copy of such schedules and of all changes and revisions thereof so filed.

The Executive Authority of any division may, from time to time, with the approval of the Paper Industry Authority, change in respect to all or any of the products of such division, the period of time which shall elapse between the date of filing and the effective date of any such schedule; provided, however, that such period shall not be less than twenty-four (24) hours or more than five (5) days; and provided further, that pending the holding of a meeting of the Paper Industry Authority the chairman thereof may grant an interim approval of such action. The Executive Authority shall give immediate notice of such change to the members of the division.

The subordinate code of any division may contain a provision limiting the time within which future deliveries may be contracted for at the prices scheduled at the time of the contract; and the Executive Authority of each division may require the filing in such manner as it shall prescribe of such data as it may require in respect of contracts for future deliveries existing at the effective date of this Code.

3. No such schedule of prices and terms and conditions of sale filed by any member, or in effect, at any time in any quarter of any calendar year shall be such as to permit the sale of any product at less than the lower of the following:

(A) The cost of such product to such member during the last period of three consecutive months or three accounting periods of four weeks each, ending not less than thirty (30) days prior to the first date of such quarter, which cost shall be determined pursuant to the method of accounting and costing prescribed by the Paper Industry Authority under this Article as soon as that method is prescribed and theretofore pursuant to the method employed by such member subject to such preliminary rules as the Paper Industry Authority shall from time to time prescribe.

(B) The lowest price scheduled for such product under the provisions of this Article by any other member and then in effect.

Each schedule filed under this Article shall state whether the prices, terms and conditions therein specified are justified under subdivision (A) or under subdivision (B) of this Section, and in the case of justification under subdivision (B) shall identify the schedule or schedules of the other member or members of the industry justifying such prices, terms and conditions. A schedule justified upon the basis of the schedule or schedules of another member or members shall become void forthwith upon the cancellations or revisions upward of such justifying schedule or schedules.

In applying the provisions of this Section and of Sections 4 and 5 of this Article, all prices shall be calculated on a delivered basis, and the cost of delivery shall be considered a part of the cost of the product; provided, however, that in the case of each product the Executive Authority of the division in which such product falls may amplify, define or modify this principle.

Notwithstanding the provisions of this Section, discontinued lines or damaged goods or seconds of any product may be disposed of in such manner and on such terms and conditions as the Executive Authority of the division into which such products fall may approve.

4. The Paper Industry Authority shall have power on its own initiative, or on the complaint of any member, to investigate any price for any product shown in any schedule filed hereunder by any member, and for the purpose of the investigation thereof to require such member to furnish such information concerning the cost of manu-

facturing such product as the Paper Industry Authority shall deem necessary or proper for such purpose. Pending such investigation, the Administrator may suspend any such price. If the Paper Industry Authority after such investigation shall determine that such price violates the provisions hereof, or would tend to render ineffective or seriously to endanger the maintenance of this or any subordinate divisional code, the Paper Industry Authority shall so notify such member and the Executive Authority with which such price was filed, and thereupon such price shall become void and of no effect. A notice of all decisions of the Paper Industry Authority under this Section, together with the reasons therefor, shall be filed with the Administrator. All such decisions shall be subject to suspension, cancellation or modification by the Administrator.

5. Except in fulfillment of bona fide contracts existing on the effective date of this Code, no member of the industry shall sell any products of the industry for domestic consumption at a price or prices lower than or upon terms or conditions more favorable than stated in his price schedule filed as hereinbefore provided.

6. The Executive Authority of any division may, with the approval of the Paper Industry Authority, suspend for any period of time and from time to time all or any of the provisions of Sections 2, 3, 4, and 5 of this Article in respect of any or all of the products of such divisions; provided, however, that pending the holding of a meeting of the Paper Industry Authority the Chairman thereof may grant an interim approval of such action.

Article VIII—Reports-Statistics

1. Each member shall prepare and file with the Executive Secretary of the Paper Industry Authority at such times and in such manner as it may prescribe, statistics of plant capacity, volume of production, volume of sales in units and dollars, orders received, unfilled orders, stocks on hand, inventory both raw and finished, number of employees, wage rates, employee earnings, hours of work and such other data or information as the Paper Industry Authority or the Administrator may from time to time require. Any or all information so furnished by any member shall upon the approval of the Administrator be subject to checking for the purpose of verification by an examination of the books and accounts and records of such member by any disinterested accountant or accountants or other qualified person or persons designated by the Paper Industry Authority.

2. Except as otherwise provided in the Act, or in this Code, all statistics, data and information filed or required in accordance with the provisions of this Code hereof shall be confidential and the statistics, data and information of one member shall not be revealed to another member. No such data or information shall be published except in combination with other similar data and in such a manner as to avoid the disclosure of confidential information. The Paper Industry Authority shall arrange in such manner as it may determine for the publication currently to members of each division, of the divisional totals of orders received, unfilled orders, shipments, stocks of finished goods on hand and production.

3. The Paper Industry Authority shall make to the Administrator such reports as the Administrator may from time to time require.

4. In addition to information required to be submitted to the Paper Industry Authority there shall be furnished to Government Agencies such statistical information as the Administrator may deem necessary for the purposes recited in Section 3 (a) of the Act.

Article IX—General Provisions

1. If any member is also a member of another industry, the provisions of this Code shall apply to and affect only that part of his business which is included in this industry and if the products of any member fall in more than one division of the industry the provisions of any divisional code shall apply to and affect said member only as to products falling in such divisions.

2. In the event that the divisional associations or Executive Authorities of any two or more divisions shall be unable to agree on any matter or matters affecting such divisions, the Paper Industry Authority shall decide such matter, and its decision, when approved by the Administrator, shall be binding on all concerned.

3. The Executive Authority of any division may formulate a complaint to the President of the United States, pursuant to the provisions of Subdivision (e) of Section 3 of the Act, that any paper, paperboard or pulp is being imported into the United States in substantial quantities or in increasing ratio to domestic production of any competitive paper, paperboard or pulp, on such terms or under such conditions as to render ineffective or seriously to endanger the maintenance of this Code, or of any divisional code subordinate hereto and deliver the same to the Paper Industry Authority which shall transmit such complaint to the President.

4. The Paper Industry Authority shall have power to investigate alleged violations of this Code and acts or courses of conduct by any member or divisional association which are or appear to be contrary to the policy of the Act, or which tend or may tend to render ineffective this Code or any divisional code and to report the same with recommendations to the Administrator.

5. The Paper Industry Authority may, on its own initiative, or upon application from any Executive Authority shall, present to the Administrator reommendations based on conditions in the industry which will tend to effectuate the operation of this Code and the policy of the Act and in particular along the following lines:

(A) For the establishment of rules of Fair Trade Practice for the industry and the codification of its trade customs, and the enforcement thereof.

(B) For the establishment of a standard method for determining the current cost of any product of the industry, and for a requirement that no member shall sell any such product below such cost.

(C) For restrictions on the creation of new facilities for the manufacture of any product of the industry or on the acquisition by any member of new equipment for such manufacture, and on the shifting of equipment from the manufacture of one kind or type of such product to another kind or type thereof.

(D) For the establishment of terms and conditions regarding sales to dealers and distributors by members of the industry.

(E) For the establishment of plans to bring about a reasonable balance between the production and consumption of the products of the industry.

(F) For the establishment of rules relative to work on Sundays and holidays and to a weekly day of rest and to overtime work generally and rates of wages thereof.

Such recommendations, when approved by the Administrator, shall have the same force and effect as other provisions of this Code.

6. Any work or process incidental to, and carried on by a member at his plant as a part of the manufacture of any product of the industry, shall be regarded as a part of the industry.

7. In order to maintain at all times an adequate domestic supply of raw material for the use of the industry, it is the declared purpose of the industry to conserve forest resources and bring about the sustained production thereof. The Paper Industry Authority and the Executive Authorities of the respective divisions shall co-operate with the Secretary of Agriculture and other National and State officials and agencies and with the code authorities of other industries in planning such practical measures as may be necessary to accomplish such declared purpose. And shall, upon the request of the Secretary of Agriculture, join with the Lumber and Timber Products Industries in any conference which may be held pursuant to the provisions of Article X of the Code of Fair Competition of the Lumber and Timber Products Industries approved by the President on August 19, 1933.

8. The Paper Industry Authority shall make a study of conditions in the industry to determine the feasibility of the adoption of a shorter working day and shall, within three (3) months after the effective date of this Code, make a report of its findings to the Administrator. The Paper Industry Authority shall also submit to the Administrator within six (6) months after the effective date of this Code a plan for the stabilization and regularization of employment.

9. Such of the provisions of this Code or of any divisional code as are not required to be included therein by the Act may, with the approval of the President of the United States, be modified or eliminated as changes in circumstances or experience may indicate.

10. This Code and each divisional code and all the provisions thereof are expressly made subject to the right of the President, in accordance with the provisions of Clause 10 (b) of the Act, from time to time to cancel or modify any order, approval, license, rule or regulation, issued under Title 1 of said Act, and specifically to the right of the President to cancel or modify his approval of such code or any conditions imposed by him upon his approval thereof.

11. This Code shall become effective on the second Monday after the date upon which it shall be approved by the President of the United States.

Schedule "A"

Paper, the manufacture of which is excluded from the industry.

(A) The product referred to as "standard news print paper" in paragraph 1672 of the Tariff Act of 1922 and in paragraph 1772 of the Tariff Act of 1930.

(B) All other papers, except rotogravure paper, when, but only when and only to the extent that, such other papers are manufactured and sold for regular use in the making of daily newspapers.

Schedule "B"

Binders Board and all other Wet Machine Boards.

Bristol Boards.

Cardboard and Mill Blanks, coated or surface-treated subsequent to initial manufacture.

Bogus Wrapping, Sheathing Paper, Indented, Ham Wrapping.

Sulphate Boards and Sulphate Corrugating Materials.

Specialty Folding and Specialty Non-Folding Boards, including all boards made from prime or fresh wood pulp, jute stock and rope stock.

Schedule "C"

Binders Board Division
Blotting Paper Division
Bogus Wrapping and Packing Division
Book Paper Division
Bristol Board Division
Cardboard Division
Cellulose Wadding Division
Cover Paper Division
Fibreboard Division
Glassine and Greaseproof Paper Division
Groundwood Paper Division
Kraft Paper Division
Leatherboard Division
Paper Shipping Sack Division
Pulp Producers Division
Soda Pulp Division
Specialty Paper and Board Division
Sulphate Pulp and Board Division
Sulphite Paper Division
Tissue Paper Division
Vegetable Parchment Division
Writing Paper Division

Merger To Have Assets of $10,000,000

According to a press dispatch from San Francisco consolidation of three pulp companies operating in Washington State and having total assets exceeding $10,000,000 will be effected March 1, 1934, if stockholders approve the proposal submitted by the directorate of Rainier Pulp and Paper Company, Sound View Pulp Company and Olympic Forest Products Company.

The new company, it is believed, will be the largest independent producer of pulp on the North American continent.

The plan, to be voted on by stockholders of the three companies affected in San Francisco, Seattle and Everett on December 5, contemplates the formation of a new company, yet to be named, which will acquire the assets of the three present companies in exchange for its stock.

The Rainier Company will receive 200,000 shares of stock in the new company in exchange for its assets, including $500,000 of net working capital. The excess of net working capital above $500,000 will be written by the company and will be available for the payment of dividends to the Class "A" stockholders.

The Sound View Company will receive 125,000 shares of stock in the new company in exchange for its assets, including $400,000 of net working capital. The excess above $400,000 will be written by the Olympic Company. The new company will assume the obligation of the $1,250,000 of first mortgage bonds of the Olympic Company.

Upon completion of the consolidation, the new company will have three modern pulp mills located at Shelton, Everett and Port Angeles, Wash., with an annual capacity of approximately 170,000 tons of sulphite pulp and will be amply supplied with working capital.

The new company will have 750,000 shares of no par value stock of which 496,585 shares will be issued under the new plan.

It will have a board of seven directors of which two will be named by Rainier, three by Sound View and two by the Olympic Company. These will be E. M. Mills and J. D. Zellerbach for Rainier; U. M. Dickey, H. H. Fair and Stuart L. Rawlings for Sound View; Charles R. Blyth and I. Zellerbach of the Olympic Company.

It is contemplated that E. M. Mills, now president of both the Rainier and Olympic companies, will be named president of the new company.

Not Connected With Distributing Firms

The Gummed Products Company, Troy, Ohio, wishes to announce that none of the members of the company including Ed. F. Herrlinger are in any way connected with any paper distributing concern in the United States.

This statement is intended to correct an erroneous impression that seems to prevail in certain sections.

A Review of the Literature of Sizing

By E. Sutermeister[1]

(Continued from the issue of the PAPER TRADE JOURNAL *of July 27, 1933)*

Testing and Properties of Rosin

It is not possible to make a clear-cut separation of the testing and properties of rosin or to separate these entirely from the testing of sizes, so more or less duplication and overlapping must be expected.

In the present state of our knowledge it is not possible to predict from the analysis and tests of a rosin how it will act in the sizing of paper. It is probable that radical differences might be considered as indicative, but the effect of small variations is quite unknown. Much more work will have to be done before it is possible to predict the value of a rosin from its chemical analysis.

Evidence regarding the effect of the color and grade of rosin on the paper is somewhat contradictory, but it seems to favor dark grades for efficient sizing and light grades for better color in the paper. No proof of the reason for more efficient sizing with low grade rosin is presented, but it is suggested that it may be due to the presence of unsaponifiable oils in the rosin.

There seems to be unusually good agreement that the effect of light on rosin is to cause oxidation and discoloration and an increase in the amount of material insoluble in petroleum ether. Some unusually interesting studies on the effect of various light rays are presented.

Two methods for separating rosin into two fractions are mentioned and the relation of the two portions to sizing is discussed.

TESTING

An anonymous writer (Seifenfabr. *34* 266 (1914)) mentions an American product known as "Ruby" rosin and gives methods for its detection. Kennedy (Paper Industry *7* 744 (1925)) describes methods of rosin analysis and their interpretation from the standpoint of the size maker. Aschan and Enkvist (Papier-Fabr. *28* 609 (1930)) discuss the determination of the petroleum ether-insoluble portion in rosin and claim that it should be made on ground rosin with a particle size of not over 3-4 mm. They find that too fine particles give unusually low results, and recommend the use of ether of 65-75 degree boiling point and shaking or grinding during extraction. Ridley (Ind. Chem. *6* 369 (1930)) states that the chief physical constants which bear on the value of rosin in size making are matter volatile at 100 degrees; ash; unsaponifiable matter; acid number; and saponification number. For a very satisfactory F grade rosin these were found to be 0.032%, 0.23%, 6.4%, 167 and 180 respectively. He claims that the unsaponifiable portion reduces the value of the size by forming sludge in tanks and pipes.

Von Possanner (Wochbl. Papierfabr. *44* 2219 (1913)) has investigated the saponification number of American F. rosin by saponifying, acidifying, extracting with ether and again saponifying. He found the saponification number decreased by this treatment but remained constant after the fourth or fifth series.

PROPERTIES.

Von Possanner (Papier-Fabr. *8* 221 (1910)) claims that the color of the original rosin has no influence on the color of the emulsion, though it may affect that of the paper, while Becker (Paper Trade J. April 13, 1922, Convention No.) states that the color of the emulsion influences that of the paper, even if both dark and light emulsions are made from the same rosin. He finds that in order to produce a light colored emulsion the temperature of both the size and the diluting water should be kept low.

In a general discussion of sizing problems (Tech. Assoc. Papers *1* 58 (1918)) Lawrence says that the grade of rosin is without influence on the sizing, except for its influence on color. Gesell thinks that low grades are better for sulphite papers and Carruth says that with high grade rosin they had to use about three times the normal amount of rosin to get the same sizing as when low grades were used. Gesell thinks the superior effect is due to unsaponifiable oils in the low grade rosin, while Haug (Wochbl. Papierfabr. 53 3935 (1922); 54 25, 243 (1923)) found from laboratory sizing tests with as high as 50 per cent unsaponifiable matter in the rosin that it had no injurious effect on the sizing. Kent (Tech. Assoc. Papers *5* 80 (1922)) also finds that larger amounts of high grade rosin are necessary than when F, G and H grades are used but says that high grades have improved the color of the paper in some cases. Sutermeister (Paper *27* No. 13, 22 (1920)) found in laboratory experiments that the sizing value of rosins increased in passing from D to WW grades and that the color of the rosin did not appreciably affect that of the paper. Later work on a mill scale (unpublished) failed to confirm the superiority of WW rosin. H. Schwalbe (Papier-Fabr. *26* 738 (1928)) adds to the evidence in favor of low grades for more efficient sizing, but says the sizing power may vary considerably within the same grade. Arnould (Rev. univ. papeterie. *2* No. 12, *7* (1919)) states that success does not depend entirely on the quality of the rosin, but that the method of sizing, the water used and the manner of drying are very important.

The sensitivity of rosin to light is discussed by C. G. Schwalbe (Wochbl. Papierfabr. *38* 1303 (1907)) who finds an auto-oxidation going on which greatly increases the fraction insoluble in petroleum ether. Cloudy rosin, unsuitable for sizing, also shows a high per cent of material insoluble in petroleum ether and this portion is probably the cause of poor sizing. Its effect is shown by a deep coloration of the rosin size, which persists in the finished paper, and by a rapid loss of sizing when the paper is exposed to direct sunlight. The change to petroleum ether-insoluble is more rapid in powdered than in lump rosin and the melting point increases with increase in the insoluble part. In a later paper (Z. angew. Chem. *24* 1918 (1911)) he points out that unsaponifiable matter in rosin coarsens the emulsion obtained and that the part insoluble in petroleum ether has no sizing action. This latter point is reiterated by Schwalbe and Kuderling (Wochbl. Papierfabr. *42* 4197 (1911)) who examined American, French and Greek rosins. In American rosin they found from 1.82 to 5.76 per cent insoluble in petroleum ether. Kennedy (Tech. Assoc. Papers *12* 254 (1929)), on the other hand, claims that oxidized rosin has better sizing value than unoxidized, and Uzac (Rev. gén. colloïdes *4* 257 (1926)) also disbelieves Schwalbe, as he found that powdered rosin which had stood in the open air three years gave the same results as ordinary rosin.

Klason (Svensk. Pappers-Tidn. through Paper Trade

[1] Member TAPPI, chief chemist, S. D. Warren Company, Cumberland Mills, Maine.

Received February 15, 1933.

J. 57 No. 17, 46 (1913)) also states that rosin absorbs oxygen when exposed to light and that the product is darker in color than normal and very difficultly soluble in petroleum ether. American rosin exposed to sunlight during the summer months increased about 9 per cent in weight. The oxidation forms first an active peroxide and finally an inactive dioxide. The product is weakly destrorotary while colophony is laevorotary. Kimberly and Hicks (Bur. Standards J. Research 6 819 (1931)) studied the effect of light from an inclosed arc on bleached and unbleached rosin and on resinates of sodium, aluminum and iron. Rosin darkened in color, even in an atmosphere of inert gas and the change was about equal with the bleached and unbleached material. Ferrous resinate was light sensitive, but ferric, aluminum and sodium resinates were not. Schoeller (Wochbl. Papierfabr, 43 3222 et seq. (1912)) recommends the oxidation of the rosin before making into size as a means of preventing the discoloration of the paper.

Zhereboff (Bumazhnaya Prom. 2 No. 1, 59 and No. 2-3, 187 (1923)) has made an extensive study of rosins and gives the analytical constants for a large number. He confirms the oxidation and darkening of rosin exposed to the atmosphere and that such rosin is useless for sizing, but calls attention to the fact that finely divided rosin in paper is preserved for years. On exposing solutions of rosin in petroleum ether to white, blue and green rays of light in the presence of oxygen, precipitates appeared in one day, three days and nine days respectively. In the absence of oxygen the precipitate appeared on the third day for blue light and the twelfth day for green light. The conclusions reached are that about two-thirds of the compounds present in colophony undergo chemical changes, even in the absence of oxygen, and that blue and green rays act about equally under these conditions. Oxygen increases the rate of reaction of green rays and causes violet, ultraviolet and blue rays to have greater effect on the composition of the rosin. The destructive action of sunlight on rosin is not limited to oxidation, but compounds are formed which are insoluble in petroleum ether and have high ether numbers.

He found that rosin could be separated in two ways into two acid groups, (a) by dissolving in a mixture of petroleum ether and alcohol and then adding a few drops of water, and (b) by diluting a prepared size with a small amount of alcohol to make it more fluid and then adding it drop by drop to water at 30 degrees. This causes the free rosin to precipitate, while the soap stays in solution. The petroleum ether group of (a) (or the saponified group of (b)) is light yellow, very sticky and insoluble in aqueous alcohol, while the other group, found in size as free rosin, is dark, immobile even at 90 degrees, not sticky, brittle and soluble, even in 50 per cent alcohol. Most resins contain 35 to 50 per cent of the dark group. Sizing tests made by dipping filter paper into alcoholic solutions of each and drying at 80 degrees gave good sizing with 2.6 per cent of the light group and no sizing with 9.3 per cent of the dark group.

Korotkov (J. Chem. Ind. (Moscow) 7 1165 (1930)) has made tests of a series of 6 rosins prepared at temperatures from 180 to 295 degrees and one prepared at 165 degrees and 160 mm., and showed the most stable to be prepared at 200-270 degrees, while those made at 180 degrees and 295 degrees absorbed the most oxygen on exposure to air. On exposure for one year the iodine numbers decreased 74 to 8 per cent and the acid number 12 to 8 per cent. Oxygen absorption reached its maximum in six months.

Uzac (Rev. gén. colloïdes 4 257 (1926)) found that dry Al_2O_3 and dry free rosin do not combine, even at 300 degrees, but if both are freshly precipitated and remain in contact, a partial combination takes place. As the partly combined mixture can be heated to 150 degrees for an hour without melting it seems probable that the remaining free rosin forms a rosin-basic resinate compound.

Size Making and Dissolving

The fact that there are few recent papers of a scientific nature on size making indicates that the usual methods have been fairly well standardized and it is felt that the process is understood, but as late as 1910 there were discussions as to the amount of soda ash which it was safe to use, and up to 1900 claims were still made that cooking under pressure was superior to working in open kettles. Numerous modified methods of size making have been tried and described, among the latest being the use of colloid mills for preparing emulsions with or without alkalies and protective colloids, and processes for preparing dilute solutions in the cold by direct contact of weak caustic soda solutions.

The properties of emulsions are discussed and attention called by several writers to the fact that at the dilution obtaining in the beater practically complete dissociation into free rosin takes place. Some of the factors influencing the preparation of emulsions are discussed and a method for making a clear emulsion without a mechanical emulsifier is described.

Brief notes are made of nearly 30 patents relating to size making and dissolving.

In spite of all this work there seems to be no definite proof that any one method, either for making the size or preparing the emulsion, is better than any other. It would seem that the present, generally employed methods have reached a highly satisfactory stage by the use of "trial and error methods of investigation.

The early methods for making size need not be discussed here as they consisted essentially of boiling rosin with an alkali in an open tank. Even as late as 1904 the question of the amount of alkali necessary was discussed by Klemm (Wochbl. Papierfabr. (1904)) who gave tables showing the amounts of free and combined rosin which would be expected for different amounts of caustic soda used. Von Possanner (Papier-Fabr. 8 221 (1910)) states that if an emulsifier is not used to prepare the emulsions, the minimum amount of soda ash which it is safe to use is 10 per cent of the weight of the rosin, but if an emulsifier is employed this may be reduced to as little as 6.5 per cent. Lawrence (Paper, Feb. 13, 1918) recommends starting saponification with caustic soda and finishing with soda ash. Hofmann (Papier Ztg. 28 3526 (1903)) states that much free rosin causes specks and tends to plug up wires and felts. The size solution should be diluted to 18 grams of rosin per liter and well mixed with the stock before adding the alum.

Arledter (Ger. Pat. 95,416, 1897) recommended boiling rosin with alkali under 10 atmospheres pressures. In English patent 22,547 (Nov. 11, 1899) Arledter and Huth specify boiling in a jacketed boiler under pressure with 20 per cent of water and 7 per cent of alkali. The size is then pumped through a filter into another vessel and mixed with 2 per cent of phenol. According to Röhr (Eng. Pat. 624 Jan. 10, 1900) powdered or melted rosin is incorporated with an alkali or carbonate in a closed vessel under pressure at a temperature below 100 degrees and then cooled below 70 degrees, or the pressure is reduced while the temperature is kept between 100 and 70 degrees until the rosin becomes soluble.

Bacon (Eng. Pat. 28,886 Dec. 18, 1906) prepares a dry size by mixing finely ground rosin with the requisite

quantity of crystallized sodium monosilicate and heating in a steam jacketed pan for 30 minutes. The melt is run onto a cold surface, allowed to set and then ground.

Sommer (Brit. Pat. 20,189 Sept. 12, 1911) makes 100 parts of pulverized rosin into an emulsion with water and mixes with this a solution of 20 parts of calcined soda ash in 2000 parts of water at 14 degrees. Williams (Paper Mill, *53* No. 44, 16 (1930)) crushes the rosin, grinds it to a soft paste with water in a pebble mill and adds other constituents, such as alkali and protective colloids if desired. Grinding is continued until the reaction or mixing is complete. Hilaire (Paper Trade J. July 17, 1930) describes briefly the Delthirna process, which consists in passing a weak solution of caustic soda over rosin at room temperature. This process is also described by Hochberger (Papier-Fabr. 27, 83, 97 (1929)) while Dolivo-Dobrovolskii and Kahan (Zellstoff Papier *9*, 836 (1929)) mention a process which is practically identical with the Delthirna. They recommend a 0.5 per cent caustic soda solution, a temperature of 22 to 24 degrees and pieces of rosin 2 to 2½ inches in size.

Taylor, Schwalbe and Myers (Paper Trade J. June 16, 1932) give a brief review of some of the modern size making processes including the Delthirna, Williams and Bewoid. This paper also mentions the solvent sizing process of Minton and the recently introduced dry sizes.

Chemnitius (Chem. Ztg. *54* 915 (1930)) gives detailed directions for size making. This article is interesting chiefly because of the refinements applied, many of which seem quite unnecessary. Fournier (Papeterie *53* 618, 678 (1931)) discusses the mechanism of sizing and the chief processes for preparing size.

In discussing the preparation of solutions or emulsions Klemm (Wochbl. Papierfabr. *36* 768 (1905)) states that dilution causes the dissociation of the size into free rosin. The particles should be as fine as possible and the chief influencing factor is agitation. He recommends an emulsifier. Haug (Wochbl. Papierfabr. *53* 3935 (1922)) finds that when highly diluted with distilled water sodium resinate undergoes hydrolysis which is approximately 100 per cent, and Ivanoff (Bumazhnaya Prom. *1* 33 (1922)) also concluded from his studies that at beater dilution practically all of the rosin was in the free state. This does not seem to agree with De Cew's statement (Manufacture of Pulp and Paper Vol. 4 1st Ed.) that a high free rosin size gives to paper a hardness and snap that cannot be obtained when a neutral size is used.

Von Possanner (Papier-Fabr. *8* 221 (1910)) states that a white opaque emulsion indicates particles of 0.01 mm. or more, which show no independent motion. Brown and nearly transparent emulsions may be made from the same size by proper adjustment of the emulsifier. In such emulsions the particles are 0.002 mm. or less and show strong movement. Haug states that the emulsions made from rosin milk containing 20 per cent unsaponifiable matter contained coarser particles than normal, and flocculated more easily. von Possanner (Wochbl. Papierfabr. *42* 2116 (1911)) finds that pure sodium resinate is 4 to 5 per cent soluble in water to form a clear solution. With addition of free rosin it becomes more soluble and with 20 per cent of free rosin its solubility is 8 per cent. Further increase in free rosin does not give clear solutions. Kent (Tech. Assoc. Papers *5* 80 (1922)) finds that when amber colored emulsions are not used the color of the emulsion will vary directly with the amount of free rosin. Methods of emulsification have a direct bearing on the color of the emulsions produced.

Sieber (Zellstoff Papier I 15, 65, 139, 184 (1921)); II 99, 134 (1922)) states that an aqueous solution containing sodium soap and free rosin is clear only at concentrations of 4 to 5 per cent and within narrow temperature ranges. Upon dilution dissociation and separation of rosin in needles takes place.

Von Possanner (Papier-Fabr. *8* 221 (1910)) says that the temperature at which the emulsion is made should be between 70 and 90 degrees, and it should be cooled at once by blowing into cold water. The final emulsion should contain 30 to 40 grams of rosin per liter. An emulsion containing free rosin must not be boiled; coagulation will take place the more readily the less alkali used in cooking the size. Barat (Fr. Pat. 422,061) claims that in dissolving size the injection of live steam is injurious. He withdraws size and water from their tanks by means of compression pumps and prepares an intimate emulsion by allowing the compressed liquids to escape suddenly into a storage tank. Kamm (U. S. Pat. 1,415,363 May 9, 1922) prepares a clear emulsion from a size containing 30 per cent free rosin by heating it until clear and homogeneous, adding 4 to 5 parts of hot water and heating practically to boiling, until it is again clear, and then pouring it into 45 parts of water.

A few notes on other size making processes, noted in the literature or in patent specifications follow.

Arledter (U. S. Pat. 701,125 May 27, 1902). Oil or fat is mixed with molten rosin and filtered. An ammonium salt—chloride or carbonate—and sodium carbonate are added in quantity to produce partial saponification and the mixture is agitated in contact with CO_2. The product contains free rosin, free alkali and ammonium resinate.

De Cew (Brit. Pat. 12,686 May 22, 1914). Rosin is boiled with alkali insufficient to completely saponify it, while tanning materials are added to cause a larger amount of free rosin to be held in solution and give finer subdivision of the free rosin.

Dreher (Ger. Pat. 118,233 Jan. 19, 1900). A mixture of 100 parts rosin, 20 parts phenanthrene and 7½ parts NaOH is boiled in 25 parts of water for 1 hour. In another patent (Eng. 24,375 Nov. 18, 1898) he states that with the addition of 2 per cent of phenol a size can be made containing 40 per cent of free rosin and yielding a perfectly smooth emulsion and an odorless paper.

Muth (Ger. Pats. 301,926 and 316,617 1919) utilizes coumarone and indene resins emulsified in rosin or fatty soap. They may be previously emulsified with colloids, such as casein, albumin, etc.

Schacht (Ger. Pat. 281,515 Feb. 2, 1913) mixes a colloidal substance (starch, casein, glue, etc.) with a completely cooked size and then passes in a gaseous acid.

Thornton (Brit. Pat. 175,034 Nov. 5, 1920) mixes a colloidal solution, such as feculose, glue, casein, etc., with rosin size which is then diluted and added to the beater.

Weiger (Brit. Pat. 335,902 Filed 7/1/29) also uses casein with the rosin size.

Milligan (Brit. Pat. 12,910 July 17, 1900) produced a size solution by dusting a mixture of 4 parts starch, 1 part soda and 4 parts rosin on the surface of boiling water.

Mitscherlich (Eng. Pat. 8042 March 29, 1897) specified the use of horn or keratin bodies in the size.

Rubber resins are mentioned by Ellis (U. S. Pat. 1,007,681 Nov. 7, 1912) who states that Jelutong and Pontianac resins may replace the free rosin in size. As an example he cites a size made by cooking 50 parts Pontianac, 5 parts Guayule, 50 parts rosin and 10 parts KOH in 50 parts of water. Häuser and Boedeker (Ger. Pat. 283,111 Dec. 9, 1913) and Remington (Ind. Chem. *1* 467 (1925)) also mention a mixture of rubber resins and colophony saponified with NaOH or Na_2CO_3.

According to Chemische Fabrik Pott & Co. (Ger. Pat.

507,506 May 26, 1925) rosin and resinous substances are rendered water soluble by aqueous solutions such as sulphonic acids, aromatic, chiefly polynuclear carbohydrates whose substitution products form salts with these substances.

Schoeller (Ger. Pat. 257,158 Mar. 20, 1912) oxidizes the rosin before making it into size, by treating it with calcium hypochlorite or potassium permanganate.

Manson (Can. Pat. 245,096 Dec. 9, 1924) emulsifies rosin and clay in the cold and adds a small amount of alkali if desired.

Girardet (Fr. Pat. 635,419 Mar. 15, 1928) prepares a size by the action of sodium carbonate solution on rosin in the cold and treats it with alum before use.

De Cew (U. S. Pat. 1,223,480 April 24, 1917) prepares a cold size containing ammonium resinate, ammonia and water, but no free rosin, and forces this thick, cold size under pressure into a body of water or other thinning agent. Another patent (U. S. 1,317,616 Sept. 30, 1920) relates to diluting a rosin size of over 25 per cent free rosin and discharging it into a cold solution of sodium silicate until it contains 2 per cent total solids. In Canadian patent 260,716 (May 11, 1926) he describes the preparation of a colloidal solution of aluminum resinate by dissolving rosin soap and alum separately, each in the presence of a protective colloid, and then mixing the two solutions.

Plauson's Ltd. (Brit. Pat. 216,923 Mar. 2, 1923) render size colloidal in a high speed disintegrator in the presence of small amounts of chlorinated hydrocarbons, such as mono- or dichlorobenzene. Ammonia may be added to aid in colloidizing.

(To be continued)

News Print Pool Proposed

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 20, 1933.—A pool of 50,000 tons of news print to be formed by companies holding large contracts and to be divided among certain producers who are short of tonnage has been suggested as a means by which Canadian companies who find it difficult to cooperate with the terms of the NRA code may be induced to come into the line-up. This is reported here to be one of the developments of the further negotiations between Canadian, American, and European producers looking to general cooperation in the industry. It is further said that the International Paper Company is the chief contributor to the pool. Meanwhile so far as can be ascertained there is general satisfaction over the progress being made to organize the industry on a basis which will rid it of the evils from which it has been suffering. Prospects are said to be bright for 100 per cent cooperation among Canadian producers. One leading Canadian executive says he sees the best opportunity that has been offered for the cleaning up of the serious conditions which have prevailed in the news print field for the past four years. The threat of an East-West war has now been dissipated, an important factor being the marked improvement that has developed in the pulp and paper industry on the Pacific Coast in recent months. The various companies on the coast on both sides of the international boundary line have agreed not to sell news print below $40 a ton. They have also announced that no arbitrary increase in prices are contemplated, but that the adjustment in prices, if any, will not be greater than is warranted by differences in conditions, including manufacturing cost, inflation or revaluation of the dollar, as well as factors and conditions affecting the publishing industry.

Obituary

George D. Barnes

APPLETON, Wis., November 20, 1933. — George D. Barnes, secretary of the Gilbert Paper Company, Menasha, Wis., died November 16 at his home at Neenah, Wis. He was 37 years old and had never been in robust health. He became seriously ill last April.

Mr. Barnes was a brilliant student in school, and equally brilliant in his work with the Gilbert Paper Company, with which he was associated since completion of his education in 1913. His ability to master the intricate problems of finance and cost accounting led to his rapid advancement until he became a director of the company and its secretary.

Cultural and civic interests were a prominent part of Mr. Barnes' life. He was absorbed by books, flowers and music, was a Thirty-second Degree Mason and an expert on ritual, a member of the Neenah and Menasha clubs, a past president of the Kiwanis club, a director of the Twin City Building, Loan and Savings Association, a member of the Neenah public library board, and a member of the Menasha Congregational church. He gave a medal annually to the senior in Neenah and Menasha high schools who excelled in Latin.

Mr. Barnes is survived by his widow, his mother, two brothers—Robert of Oshkosh, Wis., and Ralph, of the Gilbert Paper Company—and three nephews. Burial took place at Menasha, with the Masonic Lodge in charge.

Herbert F. Finegan

MILTON, N. H., November 20, 1933.—Herbert F. Finegan, 64, for more than thirty years office manager and assistant treasurer of J. Spaulding & Sons, now the Spaulding Fibre Company, operated by former Governors Huntley N. Spaulding and Rolland H. Spaulding, of Rochester, N. H., died recently in the office of a Boston specialist.

Mr. Finegan was born in Townsend, Mass., was acquainted with Jonas Spaulding, father of the Spaulding brothers, and attended school with Huntley N. Spaulding. He came to Milton about forty years ago. His widow and a daughter, Mrs. Rosalie Pelhank, of Milton, are living.

George B. Baldwin

George B. Baldwin, vice president of the Perkins & Squier Company, book paper merchants, of 225 West 34th street, New York City, died after a short illness, November 10, 1933, at his home in Amityville, L. I.

Mr. Baldwin had always been associated with the paper business and for the past twenty-five years had been the partner of George F. Perkins, in the above mentioned company.

He is survived by his wife, Mrs. Anna Huntington Baldwin, a daughter Mrs. Norton Case, of Pittsfield, Mass., and a son, G. Gorton Baldwin, who has been associated for ten years with Perkins & Squier Company.

Max Poyck

Max Poyck, representative of the Heller & Merz Corporation, died Saturday, November 11, 1933, at his home in Syracuse, N. Y., being in his 67th year.

He entered the employ of the Heller & Merz Company in 1896 and served the company faithfully until May of this year, when he underwent a serious operation, from which he never fully recovered.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Emeryville, Cal.—The Western Waxed Paper Company has approved plans for new reinforced concrete addition to plant, to be one-story, totaling about 10,000 square feet of floor space. General contract has been let to A. T. Beckett, 224 Scenic avenue, Piedmont, Cal., and superstructure will be placed under way at once. New unit will cost over $20,000, with equipment.

Fort Madison, Iowa—The Hinde & Dauch Paper Company, Sandusky, Ohio, has work under way on improvements in mill at Fort Madison, including repairs to smaller plant unit. Work will be carried out by day labor under direction of Otto Randolph, Inc., 53 West Jackson boulevard, Chicago, Ill., architect and engineer.

Savannah, Ga.—The State Industrial Committee interested in the pulp and paper experimental laboratory, which has been in service at Savannah for a number of months past, has arranged for a lease of the property until January 1, 1936, and will develop increased facilities at early date. The Chemical Foundation, Inc., New York, has contributed a fund of $105,000 for operating expenses and additional equipment for first two years of the lease. Dr. Charles H. Herty will continue in charge of the experimental laboratory. Native timber is being used for pulp wood for paper production, to show the utility of Georgia pine for this service.

Muncie, Ind.—The waste paper plant of Manuel Dobrow, 600 South Monroe street, was damaged by fire, November 11, with loss estimated at $13,000. It is planned to rebuild the structure at early date.

Canton, N. C.—In connection with plant now being established at Canton by the Champion Chemical Company, 19 West Austin avenue, Chicago, Ill., the Champion Fibre Company, with local mill, will furnish raw materials. It is understood that company has contracted for heavy quantity of such products, for lye and allied manufacture, and will increase facilities for this purpose in near future.

New York, N. Y.—The Great Atlantic Paper Company, 79 Wooster street, has leased the seven-story and basement building at 591-93 Washington street, running through to 610-12 Greenwich street, totaling about 60,000 square feet of floor space, and will occupy for new storage and distributing. Improvements will be made in structure and possession taken at early date.

Carnegie, Pa.—The Superior Paper Products Company, Carnegie, manufacturer of corrugated paper boxes and containers, has begun work on proposed new plant in Robinson Township, recently referred to in these columns, to be one-story, reported to cost about $140,000, with equipment. Work will be carried out under the direction of Braziell & Anderson, 309 Fourth Avenue, Pittsburgh, Pa., architects. The Rust Engineering Company, Koppers Building, Pittsburgh, has the general erection contract. Company will arrange for large increase in present capacity at new location, with installation of additional equipment.

Rosslyn, Va.—The Washington Waste Paper Company, Rosslyn, is planning early rebuilding of portion of storage and distributing plant, recently destroyed by fire, with loss of about $40,000, including equipment.

Glassboro, N. J.—The Goldman Package Manufacturing Company, recently organized by David Goldman, Glassboro, and associates, with capital of $25,000, plans operation of local plant for the manufacture of corrugated and other paper containers, boxes, etc.

Panama City, Fla.—The Southern Kraft Corporation, a subsidiary of the International Paper Company, 230 East 42nd street, New York, N. Y., has preliminary plans under advisement for a new deep water terminal for service at local paper mill. It is proposed to build two new piers over a period of months, the first such structure to be about 500 feet long and 300 feet wide. A building for storage and distributing service will be constructed on the pier, to be one-story, about 225 x 500 feet. Railway line and other operating facilities will be provided. Exact time for proceeding with program has not been announced. H. D. Shope is company engineer.

Enka, N. C.—The American Enka Corporation, Enka, near Asheville, manufacturer of cellulose rayon products, has completed plans for construction of first new unit at local mill, in connection with a general expansion and improvement program to cost close to $1,000,000, with equipment. The new structure will be one-story, estimated to cost about $100,000, with machinery. General contract has been awarded to Potter & Shackleford, Greenville, S. C., and superstructure will begin at early date. Plans for other units are in progress and it is understood that bids will be asked in near future. Company engineering department is in charge.

St. Catharines, Ont.—The Garden City Paper Mills Company, Ltd., is considering the early rebuilding of portion of cutting and converting mill at Merritton, near St. Catharines, recently destroyed by fire with loss reported at close to $100,000, including equipment and stock.

New Companies, Etc.

New York, N. Y.—The Progressive Fibre Specialty Company, Inc., has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in fibre products. New company is represented by Samuel A. Brander, 405 Lexington avenue, New York, attorney.

Beaver Falls, N. Y.—The Beaverbox Manufacturing Company, Inc., Beaver Falls, has arranged for change of company name to the Beaverite Products Company.

Philadelphia, Pa.—The Glassophane Corporation has been organized with Delaware charter, under direction of the United States Corporation Company, Pennsylvania

Building, city, with capital of 1000 shares of stock, no par value, to manufacture and deal in paper and paperboard products of various kinds. The incorporators include William C. Wright and Daniel A. Ward, Philadelphia.

Detroit, Mich.—The Northwestern Paper and Mercantile Company, Detroit, has filed notice of company dissolution under state laws.

New York, N. Y.—The Eastern States Carton Corporation, recently organized under Delaware laws, to manufacture paper cartons and containers, has arranged for an increase in capital from 500 to 5000 shares of stock, no par value, for proposed operations.

Detroit, Mich.—The Detroit Paper Stock Company, 2003 Brooklyn avenue, has been incorporated with capital of $1000, to deal in paper goods. Ralph Hertzberg, 11845 LaSalle boulevard, Detroit, is principal incorporator.

New York, N. Y.—The Leubren Paper Corporation has been chartered with capital of $20,000, to deal in paper products of various kinds. Louis Brenner, 26-32 West Seventeenth street, is principal incorporator. Julius L. Pines, 276 Fifth avenue, New York, is representative.

Carlyle, Ill.—The Strawboard Research Company, 530 Fairfax street, has been incorporated with capital of 100 shares of stock, no par value, to develop and manufacture strawboard and allied products. The incorporators are Norris Reynolds, Arnold J. Marcham and Gilbert G. Early, Jr.

New York, N. Y.—The Eastern States Carton Corporation has been incorporated under direction of the Corporation Trust Company, Dover, Del., with capital of 500 shares of stock, no par value, to manufacture paper cartons and containers. The incorporators are Theodore Pearson and Franklin Benkard, New York.

Chicago, Ill.—The L. R. Rag and Paper Stock Company, Inc., 2600 Archer avenue, has been incorporated with capital of 100 shares of stock, no par value, to deal in waste paper, etc. The principal incorporators are Philip Rosenberg and James B. Lynn.

To Affiliate With American Jewish Congress

Seventy-five leading members of the paper products industry in New York, the eleventh largest industry in the United States, on Wednesday of last week undertook to form a national organization with branches throughout the United States, as an affiliate of the American Jewish Congress.

Called together at a luncheon meeting at the Hotel Commodore by Herbert Rosenfeld, the sales manager of the Continental Paper and Bag Company, the group, whose business interests represent an annual turnover of more than one billion dollars, voted that the present emergency situation in Jewish life precipitated by Hitler propaganda in Germany and abroad, necessitates a positive attitude toward Jewish life, and direct participation in such agencies as defend the rights of the Jews and safeguard their future.

The proposal for a permanent form of organization was made by Mr. Rosenfeld, who presided, and followed the address of Professor Horace M. Kallen of the New School for Social Research, who described the conditions of Jewish life in this country and abroad, and the attempt at the invasion of the rights of the Jews made by anti-Semitic forces.

The motion was seconded by M. H. Eichberg, of the Perkins-Goodwin Company, and the proposal for affiliation was made by S. T. Barron of the Royal Card and Paper Company. The machinery for the establishment of a national organization is to be decided upon at a future meeting at some near date. Mr. Rosenfeld will serve as chairman of the organization until permanent officers are named.

Among those present were: Jack Bagish, of The Paper House of New Jersey Inc.; D. Charles Ballin, treasurer of the Gilman Paper Company; S. T. Baron, of the Royal Card and Paper Company; Jacob Cohen, Hudson Supply Company, Inc.; M. H. Dicker; M. H. Eichberg, Perkins-Goodwin Company; J. Heinrich Eisenberg, secretary of the Equitable Paper Bag Company, Inc.; Max Epstein, City Cordage and Paper Corporation; Chas. Fisher; Samuel J. Fishman, of The Finkel Paper Company; H. Fishman, Westchester Economy Paper Company; W. Norman Frenkel, Gilbert Paper Company; S. Gallantz, representative of the Tri Boro Paper Company; Gilson Brothers, Inc.; Em. Gold, Premier Paper Company; Morris H. Gold of the Continental Paper and Bag Corporation; Sam Goldstein, Criterion Paper and Twine Company; M. Heller, Amsterdam Paper Company; I. Horowitz, Active Paper Company; Morris Housen, Erving Paper Mills; Irving Jaffe, President of Jaffe Paper Company, Inc.; D. Kasson, Harlem Paper Products Company; Morris Katz, Kary-Safe Paper Bag Company; Dave Katz, Imperial Bag and Paper Company, Inc.; M. Kleinman, The Ace Paper Company; Ben Kohn, Continental Paper and Bag Corporation; Benj. Kushel, National Consumpers Paper Company; Harold Kushel, Metropolitan Paper and Bag Corporation; Benj. Kushel, National Consumers Company; Albert Newman; David Ninburg, Commercial Paper Bag Company; F. J. Ogden; E. Perlman, Union Gummed Products Company, Inc.; J. M. Rubinstein; Louis Rothman, Rothman Best Company; Wm. Salzman, Brooklyn Standard Bag Company, Inc.; Charles W. Sachs, Atlas Paper Products; William Salzer, President, William Salzer Corporation; Mr. Frank Schulman; Meyer N. Schwartzappel, Harlem Paper Products Company; Jacob Sincoff, of Jacob Sincoff, Inc.; William Solomon, Globe Paper and Twine Company; Union Paper and Woodware Company; Mr. Usdan, Heller & Usdan, Inc.; Charles Wansker, Wansco Paper Products Company, Inc.; Nathan Warshaw and Abraham Warshaw, the Warshaw Manufacturing Company.

There were also present representatives of: Forbes Paper Company; Fairdeal Paper Company, Inc.; Ess & Ell Paper Company, Inc.; Bernhardt-Zinn Paper Company; Yorkville Paper Company, Inc.

Albany To Be Big Pulp Port

ALBANY, N. Y., November 20, 1933—The arrival in this city last week of Hans Bennett, managing director of the Central Wood Pulp Bureau, of Stockholm, Sweden, brought prophecies from paper mill men of increased business for the port of Albany on an extensive scale. Statistics show that this year pulpwood products shipped to the local port from Sweden and Finland have risen about 400 per cent and authorities now claim that the local terminal is on the verge of being recognized as one of the leading import harbors for foreign pulp in this country. Mr. Bennett is a member of a corporation which ships many tons of pulp to this country yearly and it was disclosed that he made the trip primarily to inspect local port facilities inasmuch as he is thoroughly acquainted with other harbors. Among the things most necessary, according to Mr. Bennett, is an increase in storage facilities. It is his belief that the increased business will continue if his company gets the same co-operation as from other ports. He was accompanied by Edwin B. Erickson, of Pagel Horton & Co., Roger McVeigh and Capt. Harry White, officials of the Jarka Corporation.

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THE PULP AND PAPER INDUSTRY, ITS POSITION AND PROSPECTS

A very interesting report outlining the present position and considering the prospects of the paper industry has just been issued by the Brookmire Economic Service. The report in part states that the manufacture of paper in the United States in the period since 1920 may be described in the aggregate as an industry in which the physical volume of output had generally trended upward during the prosperous years, but due to increasing production capacity, prices of products had fallen so rapidly as to offset the favorable effects of increased demand. As a result during the major part of the period under review the value of production was able to show only a nominal increase.

The domestic production of news print has trended downward since 1926, due primarily to increased imports from Canada. Canadian production of news print expanded rapidly between 1920 and 1929 at an annual rate of over 13 per cent, and continued to expand at about the same rate between 1925 and 1929 after the domestic industry had started to recede. Some of the increase in Canadian news print import has been due to the development of production facilities in that country by certain large domestic consumers. This together with a general excessive plant capacity has had its effect on the prices of news print, which have fallen from $70 a ton in 1925 to a current price of $40.

Producers of news print in both U. S. and Canada may find a ray of hope and the beginning of a return to profitable operations, through the formation of a code of fair competition. The details of the plan are not yet formulated, but it is expected that a truce may be arrived at on prices, and those prices should show a substantial increase from those now prevailing. It is highly probable that Canadian producers will cooperate with the NRA in coming to definite solution of this problem, since failure to do so would likely result in an agreement with Soviet Russia to supply a good portion of our wood pulp requirements, and the allotment, or exclusion, of Canadian pulp and news print.

Results of operations so far in 1933 in the Canadian and domestic news print industries indicate an increase of 2½ per cent in the output of Canadian mills, but a decrease of 6½ per cent in that of domestic mills. Prices of news print in New York over the first nine months this year averaged 21 per cent below the like period last year. It is therefore clear, that while the utilization of news print appears to be pointing upward, profits for the current year will be meagre.

Book paper production in 1933, which accounted for 19 per cent of the value of the paper industry in both 1929 and 1931, it appears will just about equal the volume of 1932. Prices of book paper during the first six months of 1933 were 8½ per cent below that period of 1932. In July these prices rose 5 per cent above July 1932 while in August a further increase carried them 14 per cent above last year. We believe these prices will at least hold near present levels, and with output for 1933 at about the same level as a year ago, a small rise in the value of output is indicated.

Book paper production between 1921 and 1929 increased 126 per cent which next to box-board output showed the largest gain of any of the principal paper products in this country. Since 1929 production of book paper has fallen until in 1932 it was only slightly below the 1920 level, but continued above that of 1921 by 50 per cent. This is a much better record than has occurred in most basic industries.

Box-board production of 1933, it appears, will be somewhat in excess of that last year, but prices (assuming the remaining months of this year to remain steady) will be 38 per cent higher than those last year. Latest available prices are running 72 per cent above last year. With output a little better than last year's volume and a rise of 38 per cent in prices the value of output will show a similar increase to that of price change. This division of the paper industry should show profitable operation for the current year. The volume of box-board production in 1932 was only 22 per cent below that of 1929, which gives evidence of a shift in usage from wooden to paper containers. In 1921 the box-board end of the industry accounted for 18 per cent of the total value of product. In 1931 it amounted to 24 per cent, and constituted the largest division of the paper industry.

Wrapping paper production for 1933 is estimated, on the basis of operations so far this year, to exceed that of 1932 by 7 per cent. Quoted prices will show little change from those last year and as a result the value of output will show approximately the same increase as that of the volume. Production of wrapping paper rose markedly from 1921 to 1923 on coming out of the 1921 depression,

but between 1923 and 1929 it showed practically no gain, and has since fallen back slightly below the 1920 level. This division of the paper industry accounts for 18 per cent of the value of production. It accounted for the same proportion in both 1921 and 1929.

Writing paper in 1931 accounted for 12.3 per cent of the value of products in the paper industry. This compares with 10.5 per cent in 1921 and 12.5 per cent in 1929. The domestic output of writing paper was very similar in movement to that of wrapping paper in the early 1920's, showing a marked increase from 1921 to 1925; steady thereafter until 1929, and falling during the next three years until in 1932 it had returned to a level between that of 1920 and 1921. Estimated output of writing paper for 1933 indicates an increase of 9 per cent over that of 1932. This will also be the approximate increase in the value of production for average prices as now indicated point to about the same level as a year ago.

In conclusion, the paper industry in all its departments has shown a demand that has been more stable than that of most basic industries. Adoption of a fair practice code and diminution of prevailing cutthroat price tactics will in our opinion return this industry's operations to a profitable basis. A greater degree of cooperation both in prices and in allocation of markets between Canadian and domestic producers can be looked for. In contrast with the chemical industry, or the steel industry, whose prices for years have been subject to a greater degree of cooperation, the paper industry will be benefited to a larger degree by price control than perhaps any other industry with the exception of the oil industry.

Use Newsprint from Southern Pine

ATLANTA, Ga., November 19, 1933.—To prove the practicability of theories that good newsprint could be made from Southern pine, nine leading daily newspapers of Georgia will issue their regular editions tomorrow on newsprint secretly made from this source.

As the papers issue damp from the presses they will be more than a proof of a theory to Dr. Charles Herty, New York and Georgia scientist whose experiments for more than three years bore fruit in the newsprint rolls now awaiting press time.

The participating newspapers raised a fund and hired three cars of a fast refrigerator train. Into these, the little Savannah plant poured southern pine pulp, 25 per cent sulphite, 75 per cent ground wood made from trees about fifteen years old against the fifty years required for equal spruce growth.

Then the pulp was shipped to the Beaver Fibre Paper Corporation at Thorold, Ontario, where it was put into a commercial machine. It ran for eight and a half hours, until it was turned into a carload of paper in standard rolls. Not once was there a break in the speeding rolls, refuting the predictions of the experts.

The plant made the run without charge and returned the paper to Georgia, where it was distributed to the newspapers.

The papers cooperating in the experiment were The Albany Herald, The Athens Banner Herald, The Atlanta Constitution, The Atlanta Georgian, The Atlanta Journal, The Brunswick News, The Macon Telegraph, The Savannah Morning News and the Waycross Journal Herald.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry have announced the following elections to membership.

Charles J. Dupuis, paper mill superintendent of the Provincial Paper Company Ltd., Port Arthur, Ontario, was formerly boss machine tender of the Niagara, Wis., mill of the Kimberly-Clark Corporation and superintendent of the Great Western Paper Company, Ladysmith, Wis.

Samuel I. Anderson, salesman for the Hooker Electrochemical Company, New York, is a 1917 graduate chemical engineer from Ohio State University. He was formerly chemical plant superintendent of the West Virginia Pulp and Paper Company and the Industrial Chemical Company, Mechanicville, N. Y., and assistant to the sales manager of the Everlasting Valve Company, Jersey City, N. J.

Richard T. Bingham of the technical staff of the Citizens Conservation Corps. Camp, Northfield, Vt., is a 1933 graduate of the New York State College of Forestry, Syracuse, N. Y., and was formerly a chemist in the Niagara Falls, N. Y., mill of the Kimberly-Clark Corporation.

Elwood C. Keyser is a 1933 graduate of the New York State College of Forestry.

G. H. McGregor, instructor in pulp and paper technology at the Institute of Paper Chemistry, Appleton, Wis., has been advanced from Associate to Active grade in the Technical Association.

William H. Palm, assistant chemical engineer, Alliance Paper Mills Ltd., Merriton, Ont., is a 1933 graduate of the University of Toronto and was formerly associated with the General Dyestuff Corporation, New York, N. Y.

Peter Van Wyck, research chemist of the Hercules Powder Company, Wilmington, Delaware, received his Ph.D. degree from Rensselaer Polytechnic Institute in 1930.

P. H. Glatfelter Appoints Agent

The P. H. Glatfelter Company, paper manufacturer, Spring Grove, Pa., appointed the Barton Duer & Koch Paper Company, Baltimore, Md., sole agent for its papers in Baltimore.

Glatfelter papers for a number of years have been sold by the Barton Duer & Koch Paper Company, but this new arrangement will give the firm exclusive distribution in Baltimore.

Glatfelter grades which the Barton Duer & Koch Paper Company will sell are: Monoplane Bond watermarked; Pennsylvania Bond, Airport, Monoplane, and Pennsylvania Book Papers; Provenworth Tinted English Finish; Everyday, Colored Fastidri, and Signature Mimeograph Papers; and such specialties as Label, Hard Sized Lithograph, Lining, and Writing Papers, as are made by the Glatfelter Company.

Wheelwright Property To Be Sold

[FROM OUR REGULAR CORRESPONDENT]

HARDWICK, Mass., November 20, 1933.—Forty lots and some 22 dwelling-houses, formerly the property of the Geo. W. Wheelwright Paper Company, are to be sold at auction tomorrow.

In the announcement of the sale, it is stated that the paper mill here, now operated as the Hardwick Paper Mills Corporation, is operating at capacity and with sufficient orders on hand to insure continued production at that rate.

CASEIN

(DOMESTIC & IMPORTED)

We have recently completed a new casein plant at Warners, N. J. and are now in position to serve you from this additional shipping point.

OTHER PAPER CHEMICALS

ROSIN SIZE
(Dry—Liquid)
SATIN WHITE
SULPHATE OF ALUMINA
(Commercial—Iron free)
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WAXINE SIZE
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535 FIFTH AVENUE • NEW YORK

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Colloidal Control in Starch Sizing*

B. W. Rowland[1]

Abstract

A procedure for adding starch to a fiber furnish and precipitating it with alum following the mechanical hydrating process is described.

The sizing value of starch as a low cost adhesive has long been recognized in the paper industry. Its application to the beater furnish, however, has by no means been general for many manufacturers have yet to be convinced of its economic possibilities in certain grades of paper. It is of some scientific interest and considerable technical importance to raise the question as to why beater starch has both skeptics and enthusiasts. Putting the question another way, what are the important mill or furnish conditions permitting some paper makers to employ beater starches effectively, while under other circumstances these advantages are lost? In the answer to this question can be found a clue not only to the rationalization of the use of beater starches but to a technique affording better results than those heretofore attainable.

Consider for a moment what a beater starch may be expected to do and why. As an adhesive, binding fiber to fiber, the presence of starch in paper should improve bursting strength, lay surface fuzz, and prevent the dusting of filler. It will be conceded that wherever starch is employed with even moderate effectiveness, these advantages are in evidence. But to secure such results, it is obvious that a substantial quantity of starch must appear in the finished sheet, and we are thus brought again to that much debated and very troublesome problem of retention.

Starch and cellulose are constitutionally closely related, and while cellulose is endowed with a rather marked surface (adsorption) activity, starch is not normally adsorbed to a great extent by paper fibers. Microscopic examination of pulp fibers treated with cooked starch in beater concentration, after staining with iodine, reveals the starch to be quite uniformly distributed on the fiber surfaces, but in an excessively thin film. Increasing the quantity of starch employed even beyond practical beater limits fails materially to increase the quantity of starch thus adsorbed. These observations may be substantiated by comparative analyses; but the facts are well established by paper mill experience. There appears then to be a quite definite upper limit to the amount of starch to be loaded into a beater furnish, this limit being set by the satisfaction of adsorption or surface energy of the pulp fibers and the economics of the case.

But so far, no consideration has been given to the possible influence of the other ingredients of the furnish; what has just been said refers entirely to the relation of cooked starch and pulp fibers only. Normally, however, alum and rosin size are added, as well as fillers, and often very hard water is used. It can now be demonstrated that these conditions may materially influence the retention of starch by pulp fibers, and so act as controlling factors in the final result.

Assuming comparatively soft water, we have not found any advantage in the use of alum for improving starch retention. But if hard water (water carrying considerable alkalinity) be employed along with alum, the hydrolysis of the latter and the resulting colloidal alumina is certain to play a role in the starch sizing process. Alumina is one of the comparatively few colloidal materials normally having a positive electric surface charge. Starch and cellulose, on the other hand, will normally bear negative charges in contact with aqueous media, and so the condition favors either the neutralization and consequent precipitation of starch and alumina, or the adsorption of alumina by cellulose, to give in effect a positive fiber surface to which negative starch may adhere through the agency of what it referred to as an "electro-static cement". Both of these possibilities would favor an improved starch retention. Parallel possibilities would obtain if to the furnish a rosin size containing a considerable quantity of rosin soap were added. The alum would favor a hydrolysis of soap to yield alkali which, in turn, would form alumina. Reserve alkalinity in the pulp would play a similar part.

It is of interest to follow these reactions on a small scale and with a microscope to observe the results. This can be done very simply by suspending a small quantity of pulp in water in a glass beaker, pouring in a small quantity, say 5 per cent, of cooked starch, then adding around 2 per cent of alum, and finally slowly neutralizing with an alkali such as ammonia, the mixture being gently stirred meanwhile. Immediately the supernatant liquor becomes clear, and if allowed to stand, everything (pulp, starch, alumina, and all) settles to the bottom. Getting a small mass of fibers onto a microscope slide and adding a drop of iodine shows the starch-alumina to exist as a delicate gelatinous body and mostly attached to the pulp fibers. Severe mechanical agitation may be observed to dislodge much of this from the fibers, and it goes about in gelatinous clumps large enough to be filtered out with ease. The experiment may be repeated with the same results, but by

RECEIVED October 26, 1933.

* Presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, Appleton, Wis., September 26-28, 1933.

[1] Professor of colloid chemistry and Stein, Hall research associate, Institute of Paper Chemistry, Appleton, Wis.

altering the order of addition of alkali and alum. It does no harm to pass the neutral point and pass into low alkalinity, and likewise it does not reverse the action to pass from neutral or alkaline back to acid again as may be done by a further addition of alum as would be made if the stock were to be rosin sized following a starch treatment.

Hand sheets made from what may thus be termed precipitated starch furnish display the beneficial effects to be anticipated. Using 4 per cent of starch, the pop strength is found to be improved approximately twice as much as would result from the use of 4 per cent of starch in the usual way. This would be a typical result for an average grade of book stock. In stronger furnishes the results are still better, and with higher additions of starch the advantages are proportionally greater, the limits noted for starch as customarily employed now being absent and replaced by those of slowness or tensile strength of the fibers, whichever is reached first. Comparable results are attainable when fillers are used. In all cases, it is essential to subject the furnish to the least possible mechanical agitation after the starch has been deposited on the fibers.

Note that the amount of alum required is much greater than that employed for the setting of rosin, and likewise the quantity of alkali (about ¼ per cent of the weight of pulp) is much greater than that usually carried by rosin size. For best results, the ratio of alum to starch should be held within certain limits because the precipitating action brings down an adsorption complex of alumina and starch, and alumina beyond the precipitation requirements will lower the adhesive strength of the mass.

Obviously, this kind of colloidal control must be altered more or less to fit a given set of mill conditions and furnish characteristics. It is more than a simple control of pH and emphasizes that fixing the final condition of acidity is not adequate to insure the optimum from the use of starch; in the case where alum is present, as it usually is, the pH history of the furnish is of outstanding importance.

Furnish carrying starch as introduced by the foregoing procedure will appear somewhat slower than usual and requires a little more drying, but otherwise it is quite normal in its machine characteristics and may be expected to display an abnormally high strength, good feel and rattle, and to be lacking in surface fuzz. As usual, some tear is sacrificed for better tensile, and the presence of starch-alumina results in slightly lower opacity.

Lake States TAPPI Discusses New Plastics

The November meeting of the Lake States Section of the Technical Association of the Pulp and Paper Industry was held in the Conway Hotel, Appleton, Wis., on November 14. About seventy-five were present to hear the two papers that were presented.

Bakelite Resins

The Lake States Section was pleased to welcome Dr. G. E. Landt, who is chairman of the Delaware Valley Section of TAPPI as its first speaker. Dr. Landt represented the Continental-Diamond Fibre Company, Newark, Del., and spoke on "The Performance of Bakelite Machined Parts in the Paper Mill." The principal factors in wearing of parts are frictional wear and corrosion. Celoron and Ryertex are resinous polymers of phenol and formaldehyde fused on cloth or paper foundations. Their desirable properties are resistance to corrosion of many kinds, low coefficient of friction with either water or oil lubrication, and low compression under load. In the paper mill, these products find use in water cooled and water or oil lubricated bearings, pump valves, doctor blades, suction box covers, table rolls and cam blocks. In any of the wide variety of uses for which they are fitted, these products give little trouble and exceptionally long life.

Chains, Conveyors and Elevators

The second paper was given by Mr. P. L. Conway of the Link-Belt Company, Chicago, Illinois, on the subject, "Chains, Conveyors, and Elevators, and their Application in Pulp and Paper Mills." The description of various types of chains and conveyors was accompanied by lantern slides showing the details.

Those Who Attended

Among those present were: A. W. Agrell, Patten Paper Company, Kaukauna; S. C. Anderson, Jos. T. Ryerson and Son Company, Chicago; A. W. Asmuth, Wisconsin Tissue Mills, Menasha; H. D. Banta, Hoberg Paper and Fibre Company, Green Bay; Paul Bornow, Valley Iron Works, Appleton; Earle Bryant, Institute of Paper Chemistry, Appleton; Karl E. Buff, Kimberly-Clark Corporation, Neenah; L. F. Bunde, Hoberg Paper and Fibre Company, Green Bay; W. H. Burns, Valley Iron Works, Appleton; George L. Cavaness, Appleton; G. J. Chapleau, Wisconsin Tissue Mills, Menasha; A. Christensen, Rhinelander Paper Company, Rhinelander; Walter C. Christensen, Hoberg Paper and Fibre Company, Green Bay; Roy L. Davis, Consolidated Water Power and Paper Company, Appleton; G. F. Enderlein, Mosinee Paper Mills Company, Mosinee; H. H. Falatick, Thilmany Paper and Pulp Company, Kaukauna; Wm. A. Fannon, Appleton; A. T. Gardner Combined Locks Paper Company, Combined Locks; LaVern Gilbertson, Institute of Paper Chemistry, Appleton; Walter Holzer, Institute of Paper Chemistry, Appleton; M. H. Haskin, Hoberg Paper and Fibre Company, Green Bay; E. C. Jacobi, Standard Oil Company, Green Bay; F. H. Johnson, Jr., Wisconsin Rapids; R. J. LeRoux, Consolidated Water Power and Paper Company, Appleton; G. E. Landt, Continental Diamond Fibre Company, Bridgeport, Pa.; Lloyd Lang, Kimberly-Clark Corporation, Neenah; H. F. Lewis, Institute of Paper Chemistry, Appleton; Bernard F. Lueck, Bergstrom Paper Company, Neenah; J. D. Line, Mosinee Paper Mills, Mosinee; H. P. Madsen, Appleton Machine Company, Appleton; G. H. McGregor, Institute of Paper Chemistry, Appleton; Earl McCourt, Consolidated Water Power and Paper Company, Appleton; G. E. McNaughton, Institute of Paper Chemistry, Appleton; Ernest B. Morse, Fannon Trading Company, Appleton; Henry E. Obermanns, Institute of Paper Chemistry, Appleton; David F. Peterson, Bergstrom Paper Company, Neenah; K. Pinkerton, Fox River Paper Company, Appleton; L. B. Powers, Kimberly-Clark Corporation, Neenah; Albert F. Piepenburg, Combined Locks Paper Company, Combined Locks; C. E. Roth, Institute of Paper Chemistry, Appleton; J. A. Staidl, Thilmany Pulp and Paper Company, Kaukauna; R. A. Stough, Wisconsin Tissue Mills, Menasha; Alex Stoyanov, Marathon Paper Mills Company, Menasha; W. H. Swanson, Kimberly-Clark Corporation, Neenah; R. W. Van Kirk, Penick and Ford Sales Company, Chicago; Ervin J. Vickman, Hoberg Paper and Fibre Company, Green Bay; H. L. Voss, Mosinee Paper Mills, Mosinee; S. D. Wells, Combined Locks Paper Company, Combined Locks; T. E. Xistris, Valley Iron Works, Appleton; W. R. Yates, Continental-Diamond Fibre Company, Chicago.

Factors Governing Absorption of Dyestuffs by Paper Fibers*

By Frederic A. Soderberg[1]

Abstract

Possible defects in the accepted methods of color application, also various essential and extraneous materials present during the processing of paper stock were investigated to determine their effect upon dyestuff absorption. We found that certain changes requiring negligible expenditures will augment color retention and enhance the appearance of the finished product.

The science of paper coloring is perhaps the most fertile field for experimentation in the entire dyestuff industry. The reason for this lies in the fact that from its inception the coloring of paper fiber has been subjugated to the other requirements necessary in the production of a perfect product. It is advisable therefore to investigate thoroughly the various substances used in the manufacture of paper to determine their individual reactions to color. The purpose of this paper is to probe the different phases of dyestuff manipulation in the mill to increase, if possible, the knowledge of paper dyeing.

Definitions

We deem it well at this point to differentiate between the terms absorption and adsorption. The necessity for dealing with both of these functions is obvious, however, since absorption occurs in most cases, that phenomenon has been given preference. Definitions for the words contained in the subject follow:

Absorption: The process of drinking up, sucking up as thru or into pores, engrossing completely, swallowing up.

Adsorption: The action of a body in condensing a gas or soluble substance upon its surface. By the word, Factors, we mean the circumstances appendent to the absorption or adsorption of dyestuff.

Dyestuff: is the material for dyeing and in this instance the aniline of coal tar products.

Paper: is a thin flexible substance made of various materials such as rag, wood, straw, and hemp. Wood, however, is by far the most common and the one with which we shall deal in the following pages.

Fiber: is the slender thread-like component of wood.

Laboratory Facilities

In order to develop this work efficiently it was considered logical to produce results in the laboratory and determine their probable reaction to practical application. In event that the findings were positive the problem could then be carried to the paper mill where definite data would be obtainable regarding its feasibility as a necessary adjunct to the process. The laboratory that we had at our disposal was completely equipped with the facilities necessary to the first step in our investigation. A brief description of this equipment will suffice.

Mixing devices with adjustable paddles rotating at 286 r.p.m. also 184 r.p.m., were used to stir the stock in small cups while the various dyestuffs and chemicals were being added. A sheet forming apparatus connected to a vacuum pump producing approximately twenty-five inches of vacuum produced sheets of paper which were pressed between pieces of rag waterleaf and then dried on a steam-heated cylinder in a manner quite similar to that used in the paper mill. Balances, sensitive to .01 mg., miniature reproductions of calender coloring and tissue dipping devices and pressure rolls for supercalendering were also available.

Chemicals

Chemicals which are necessary in the manufacture of paper in order to make the product, water resistant, increase the tearing, bursting or folding strength, give the surface of the sheet a smooth finish, or produce bulk and opacity were obtained from reliable manufacturing chemists. Dyestuff constantly comes in contact with destructive chemicals used in various parts of the mill. At times also due to laxity in processing the stock it may contain certain impurities which have a reducing effect upon the color. As part of our investigation we shall determine the effect of some of these on the dyestuff.

Absorption Control

It is necessary in coloring paper to advance or retard the action of the various dyestuffs upon the fiber. We shall discuss presently those chemicals which produce absorption and adsorption when desired, and also those which are present in the system and cause the same reactions when they are unwanted.

Paper Mill Equipment

Stock preparation in the paper mill has a decided influence on the ultimate degree of color absorption. For this reason care was taken to examine the colored pulp in the beaters, also after it had passed through the jordan engines and in mills making high grade paper the effect of centrifugal refiners was noted. The two types of paper machines in use today, the fourdrinier and cylinder type were used to obtain data. While the finishing apparatus does not affect in any appreciable way the absorption of color it was found that the supercalenders, water finish, embossing and waxing process increases the color value as high as two hundred per cent.

Contemporary Assistance

In addition to the various mills which we had access to it was our good fortune to be able to avail ourselves of the advice of color application experts. The practical and chemical mill personnel and also service engineers engaged in working out mill problems of their respective chemical products, offered their assistance. With their helpful suggestions it was possible to arrive at our conclusions without loss of time and effort.

Paper Fiber

At this time it will be well to mention the various fibers used in our work. Unbleached Sulphite adapts itself readily to color absorption due to the lignin and other impurities which have been left evenly distributed in the fiber as it comes from the manufacturing process. Bleached sulphite, which is the above product treated with chlorine, does not show the same sensitiveness to dyestuff due naturally to the elimination of the residues contained in the unbleached stock. Because of this variation in absorption it is necessary to exert extreme care when combinations of the two are used.

Bleached rag due to cost is used only in the fine grades of paper where permanence is of prime importance.

Unbleached Kraft absorbs color readily but the red cast of the stock itself necessitates the use of excessive amounts of dyestuff. Compared with sheets prepared with other fibers the colored kraft paper is invariably dull. Sufficient color must be added to cover up the fiber before a moderately bright shade may be obtained. When this stock is bleached, however, the dyestuff requirements compare favorably with those of the sulphite pulp.

The long fibered kraft has a silken sheen which is discernable in both the bleached and unbleached papers.

Bleached soda has comparatively little affinity for dyestuff and consequently requires the use of a mordant to produce acceptable coloring.

Groundwood or mechanical wood fibre due to its uneven chemical and phyical structure offers a serious problem to manufacturers of colored papers. The bundles of fibers held together by resin are impervious to the action of practically all dyestuff, thereby producing uneven results. The presence of tannic acid and various fermentation products also tend to retard the satisfactory coloring of this type of fiber.

Dyestuffs

The various dyestuffs which we selected were taken from a stock of well over four thousand different types used in every field of coloring. Since the basic, acid, and direct colors are universally used throughout the paper industry, we decided to limit our work for the most part to these types. In the manufacture of dyestuff the resultant products from various charges while of the same chemical structure are very seldom of identical tinctorial strength. It is necessary therefore to standardize each batch of color individually by the use of substances which are either inactive or increase the color's solubility. In order to determine the relative absorption of certain representative dyestuffs from each group, we decided to obtain from a plant manufacturing aniline colors a number of samples just as they come from the process, free from all standardization materials.

Basic colors are usually hydrochloric acid salts or the double salts of chloride of zinc, of dyestuff bases.

Acid colors are the sodium, potassium and ammonium salts of dyestuff acids.

Substantive or direct colors are the sodium salts of Azo colors containing sulpho or carboxyl groups. The last and least important due to their low tinctorial power are the pigment dyestuffs. This group is made up of earth colors, and must be held on the paper fiber by sizing agents.

We shall list the dyestuffs which were used, and for convenience the simple designation will be mentioned in the following pages rather than the chemical name.

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* A thesis submitted in partial fulfillment of the requirements for the professional degree of Chemical Engineer from the University of Maine.

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Red No. 1 (basic color)
A mixture of diamino-o-tolylditolazonium chloride and diamino-phenyl-ditolazonium chloride.
Red No. 1A (basic color)
The hydrochloride of diethyl-m-Amino-phenolpthalein, or tetraethyldiamino-o-carboxy-phenyl-xanthenyl chloride.
Red No. 2 (acid color)
The sodium salt of benzene-azo-benzene-azo-b-napthol-6:8 disulphonic acid.
Red. No. 2A (acid color)
An azo acid dye, especially adapted to paper. The chemical formula is not available.
Red. No. 3 (direct color)
Sodium salt of ditolyl-disazo-bis-α-naphthylamine-4-sulphonic acid.
Orange No. 1 (basic color)
Hydrochloride of benzene-azo-m-phenylenediamine or m-diaminoazobenzene.
Orange No. 2 (acid color)
Sodium salt of p-sulphobenzene-azo-b-naphthol.
Orange No. 3 (direct color)
The urea obtained by the action of phosgene on 2-amino-5-naphthol-7-sulphonic acid.
Yellow No. 1 (basic color)
Hydrochloride of tetramethyldiamino-diphenyl-ketonimine.
Yellow No. 2 (acid color)
Potassium or sodium salt of 2:4 dinitro-α-naphthol-7-sulphonic acid.
Yellow No. 2A (acid color)
Sodium salt of m-sulpho-benzene-azo-diphenylamine.
Yellow No. 3 (direct color)
Sodium salt of 2:2′-dihulphostilbene 4:4′-disazo-bis-phenetole.
Yellow No. 3A (direct color)
Sodium salt of azoxy-azo-distelbene-tetrasulphonic acid.
Green No. 1 (basic color)
Zinc double chloride or oxalate of PP′-tetramethyldiamino-tri-phenylcarbinol-anhydride, or dimethylamino-fuchson-dimethylimonium chloride.
Green No. 2 (acid color)
Sodium salt of dibenzyldiethyldiamino-triphenylcarbinol-trisulphonic acid anhydride, or sodium salt of p-sulpho-benzylethylamino-p′-sulpho-fuchson-benzyl-ethylethylimonium-sulphonate.
Green No. 3 (direct color)
Sodium salt of p-nitrobenzene-azo-3:6-disulpho-1-amino-8-naphthol-7-azo-diphenyl-azo-phenol.
Blue No. 1 (basic color)
Tetramethyldiamino-diphenazthonium chloride.
Blue No. 2 (acid color)
An anthraquinone derivative from the manufacture of lakes.
Blue No. 2A (acid color)
Potassium ferric ferrocyanide.
Blue No. 2B (acid color)
Sodium salt of triphenyltriaminotriphenyl-carbinol trisulphonic acid anhydride with disulphonic acid.
Blue No. 3 (direct color)
Sodium salt of dimethoxydiphenyldisazo-bis-8-amino-1-naphthol-5:7-disulphonic acid.
Violet No. 1 (basic color)
Hydrochloride of hexamethylpararosaniline.
Violet No. 1A (basic color)
Hydrochloride of pentamethylpararosaniline .
Violet No. 2 (acid color)
Triphenylmethane acid dye.
Black No. 2 (acid color)
Product of sulphonating spirit soluble nigrosine and converting the product into the sodium salt.
Black No. 3 (direct color)
Sodium salt of benzene-azo-3:6 disulpho-8-ammo-1-naphthol-7-azo-diphenyl-azo-m-phenylenediamine.
Brown No. 1 (basic color)
Hydrochloride of benzene-m-disazo-bis-m-phenylenediamine with triaminoazo-benzene.

We believe that the colors listed above are entirely representative of those commonly used in the paper industry and are, consequently, the types that lend themselves to profitable experimentation.

Waterleaf Fiber

The method of coloring waterleaf fiber practiced at present embodies the use of colors which have direct affinity for the fiber. This particular type of paper is used where the absorption of moisture is the prime function and for that reason, it is impossible to add any sizing material to the sheet. Basic colors are usually applied with small quantities of alum, while those of the direct group are used in combination with sodium chloride and heat. The coloring of unsized tissue from which crepe paper is made, necessitates the use of colors which have excellent solubility. Here we see adsorption taking place when the sheet is carried through the dye bath, pressed between rubber rolls and wound on a reel where it is allowed to remain until dry.

Still another method of coloring waterleaf paper is the addition of dyestuff to the headbox in dilute solution. The time element must be taken into consideration here, and basic colors which attach themselves readily to the fiber give the most satisfactory results.

By means of tests in the mill we determined that the average color loss in this type of coloring is 25 per cent. In order to overcome this fault we added the color to the machine chest by means of a meter, controlling the rate of flow and consistency of stock.

Sized Paper

Fibers that contain any one of the numerous sizing materials, adapt themselves readily to the four major groups of dyestuffs. The mordant in many instances acts as an assist in producing, level, full colored papers. Tests were made using various representative dyes and it was concluded that with the exception of pigment dyestuffs the majority of colors react most favorably to an acid condition of from pH 4.5 to 5.5 produced in the presence of rosin size and aluminum sulphate. Speaking generally, anything below the range mentioned, produced a deadened shade, while above the 5.5 figure, the colors were not entirely absorbed.

Calender Coloring

The dyeing of paper on the calender at the dry end of the machine offers several advantages as well as disadvantages when compared with the other methods. Manipulation of colors in order to produce the correct shade is controlled with far more ease since the results of any additions are immediately evident in the finished product. With modernized equipment it is possible to change without loss of tonnage from one shade to another, thereby, permitting the manufacture of small orders. The adsorption reaction which occurs covers up the impurities in the sheet that would appear on the surface of a beater colored product. The main disadvantage of this process is the fact that the colors will bleed when coming in contact with moisture. We determined that certain basic dyes such as Violet No. 1 and Blue No. 1, due to their strong affinity, are precipitated upon the fiber in such a manner as to make them practically water resistant. Paper board because of its bulk is most readily colored by this method. Natural sizing in the stock and also that which is added, necessitates the use of penetration assists which we shall discuss later. Acid colors and some of the more soluble basic dyes are satisfactory for this work. When using basic colors it was found practical to include a small quantity of acetic acid to hold the dyestuff in solution.

Fillers

Clay, Talc, Crown Filler, Titanium Oxide, and Zinc Sulphide are used in the paper industry to increase the compactness of the sheet, produce opacity, and insure a smooth finish.

All these products have distinct affinity for dyestuffs, but clay and talc comprise practically 90 per cent of the fillers consumed by paper mills today, and we shall confine our experimentation to these.

Sheets were prepared in the laboratory using the book furnish of eighty per cent bleached soda, 20 per cent bleached sulphite. Five pounds of color, 200 pounds of clay, 20 pounds of gum rosin size, and 25 pounds of alum were added to 1000 pounds of stock. Another set was prepared in the same manner, omitting the clay.

The reactions obtained by using various dyestuffs are listed:

Red No. 2, with clay, 25 per cent weaker, than when clay was not used.
Red No. 3, 20 per cent weaker and slightly brighter with clay.
Orange No. 3, 20 per cent weaker and brighter with clay.
Blue No. 1, 20 per cent weaker and definitely greener than the sample made without clay.
Blue No. 3, 25 per cent weaker and somewhat greener with clay.
Black No. 1, 25 per cent weaker with clay.

The results of these tests indicate that the filler absorbs approximately the same quantity of color as the paper fiber. In order to check this observation a test run was made in a mill using the same stock furnish with a combination of Blue No. 3 and Yellow No. 3. A shade was matched using five pounds Blue No. 3 and three pounds

eight ounces of Yellow No. 3, per one thousand pounds of stock without filler. Two hundred pounds of clay were added to the second beater, and the color formula increased to six pounds six ounces of Blue No. 3, and four pounds three ounces of Yellow No. 3. This is an advance of slightly better than twenty per cent, and served as a check for our laboratory work.

Basic color even when added in dilute solution adheres to the fiber which it strikes first. This is particularly evident in white papers, since the highly colored fibers present a granite appearance. It was found that if the color is dissolved by boiling, mixed into a paste with clay, and added to the beater as dilute as possible, the dispersion is uniform and consequently the unsightly fibers are eliminated.

Many types of talc due to their high calcium content affect aniline colors adversely. We learned by experimentation that the sizing of a sheet is lessened if the talc is added to the beater before the size and alum. If, on the other hand, the color is added then the size and alum before the talc, the stock will be sufficiently acid to neutralize any alkaline material which the filler may contain.

Rosin

Rosin size which is an emulsion of gum or wood rosin with either sodium carbonate or sodium hydroxide is rarely used except in combination with aluminum sulphate. It is of little practical value, therefore, to determine the reaction which this material has on color alone, or in combination with pulp. However, in order to complete our deductions we have included the examination of this material in conjunction with dyestuffs and fiber.

Gum rosin is the sap from resinous wood and is marketed in various grades depending upon the color. The medium or G and H types are most commonly used in the paper industry.

Wood rosin is the steam distillation product obtained from tree stumps. The color of this material is exceedingly dark, and it is used only in the cheaper grades of paper.

Aluminum Sulphate

A commercial grade of aluminum sulphate which is not iron free is used extensively in paper mills and is known as "paper maker's alum." In association with rosin size it forms aluminum resinate which when fluxed by heat serves to make the paper waterproof.

Copper Sulphate

Colors such as Blue No. 3 when used with copper sulphate show an increased fastness to light. We learned by a series of manipulations that the addition of this material pound for pound following the color, produced the most satisfactory results.

To determine this conclusively the copper sulphate was added to the beater, first, before color; second, after color but before size and alum; third, after color and size but before alum and fourth, after color, size and alum. The fastness to light of sheet number two was determined to be superior in relation to the other three.

Glue

Fish and animal glues are widely used for tub sizing in high grade paper mills, manufacturing writing, ledger, and wedding papers. We examined a number of colored papers and found that the only obvious effect which this material has upon dyestuffs is to enhance the apparent strength due to increased light refraction.

Latex

This crude rubber product has recently been introduced in paper mills with satisfactory results. Tests were made to determine its absorption value and we found that the retention of color by Latex is negligible. The use of the material in the manufacture of artificial leather and cover papers imparts a certain desirable toughness to the sheet. Latex itself is a milky liquid from which raw rubber is obtained. It is composed of small globules of rubber suspended in a water solution. It has been determined (Encyclopedia Brittanica, 14th edition, 1929) that these globules range in size from one to three microns, and that the solid matter content is approximately 12 per cent.

Acids and electrolytes with positively charged ions will neutralize the negative charges of the globules and cause coagulation. An inspection of the chemical content shows that latex has no component which could seriously affect the dyestuffs that are used in conjunction with it. A small quantity of ammonia is usually added for preservation purposes, and impairs the color strength slightly, but the ultimate precipitation by acid eliminates this difficulty.

A partial analysis of latex by the United States Rubber Company showing the active components is given below:

Rubber Hydrocarbon	31 per cent
Commercial Rubber (total solids)	34 per cent
Components containing nitrogen (Protein)	1.0 per cent
Components soluble in Acetone (Resins)	0.8 per cent
Quebranchitol	8.8 per cent
Reducing sugars	0.2 per cent
Organic Acid Salts	0.2 per cent
Mineral substances	0.4 per cent

Colors of the direct grouping were found to give the best results in combination with this material. Acid dyes tend to bleed out and cause a mottled surface. For obvious reasons basic colors are impractical as the paper must have a certain degree of color permanency. As the rubber is precipitated in the sheet, it turns black and the colors lose from twenty to fifty per cent of their brilliance.

Zinc Hydrosulphite

The use of zinc hydrosulphite in paper mill work is comparatively new. Due to the pressing need for a satisfactory bleaching agent in the Pacific Coast groundwood mills a method for applying this chemical compound was satisfactorily evolved. The material acts as a reducing agent, but unlike the majority of such compounds the action is not lost by consequent oxidation, and the paper retains its original brilliance after several months storage.

Zinc hydrosulphite is slightly acid, but not sufficiently so to affect the hydrogen ion concentration. This is due to the fact that only small quantities, (0.1-2.0 per cent by weight of stock) are necessary to give satisfactory results.

We wished to determine the action of this compound on aniline colors used in coloring the groundwood. Three sets of dyeings were prepared first, with one pound of color, the second with one pound of color and 25 pounds of zinc hydrosulphite. A third group was prepared with the same quantities of dyestuff and zinc hydrosulphite, but adding the chemical after the color, size and alum. In each case the material was applied to a stock furnish of 80 per cent groundwood and 20 per cent of unbleached sulphite.

Red No. 1 was for all practical purposes unaffected by zinc hydrosulphite, all three dyeings exhibiting the same tinctorial strength, the second and third dyeings however were slightly brighter due to the action of hydrosulphite upon the groundwood. We observed that in dyeing number three the addition of the chemical caused the color to disappear entirely, only to reappear again after five minutes had elapsed.

Orange No. 1 lost nearly its entire color value in sheets number two and three due to the action of the chemical.

Green No. 1 retained its shade and strength in dyeing number two, however, number three was brighter and only 50 per cent as strong as number one.

Blue No. 1 gave strength results identical to Green No. 1, but dyeing number three reacted in the same manner as Red No. 1.

Violet No. 1 was brighter when the hydrosulphite was included and the strengths of all three dyeings were the same.

Brown No. 1 is a color which compares chemically with Orange No. 1, and reacted in the same manner as the latter.

An examination of the data obtained indicates the most desirable method to follow when adding zinc hydrosul-

phite is to place it in the stock 15 to 20 minutes before the color is added. By doing this the bleaching material has sufficient time to exhaust before the color is placed in the beater.

Rotation of Color, Size, and Alum

Very little is known concerning the relative absorption of dyestuffs when the color, size and alum furnishes are rotated in the beater. The practical advantages derived from compiling such information dwell in the fact that every mill producing sized papers has a definite idea concerning the subject based sometimes upon local conditions, more often however on accepted procedure over a period of years. To cover this phase of the investigation thoroughly we deemed it necessary to prepare several sets of dyeings with representative colors taken from each of the major groups and applied as follows:

1. 2 pounds of dyestuff
2. 20 pounds of size
3. 25 pounds of alum
4. 1000 pounds of bleached sulphite pulp.

The following rotations were used to test each color:

A. Color, no size, no alum
B. Color, size, no alum
C. Color, no size, alum
D. Color, size, alum
E. Color, alum, size
F. Size, color, alum
G. Size, alum, color
H. Alum, color, size
I. Alum, size, color

Retention figures in the data which we shall list are comparative. It is assumed that the dyeing which shows the greatest degree of absorption in any one set is 100 per cent and the rest of the dyeings in that group are graded accordingly.

Red No. 2

A. Negligible
B. Negligible
C. 20 per cent—shade comparable with D
D. 100 per cent—level
E. 80 per cent—level
G. 50 per cent—level
H. 90 per cent—level
I. 100 per cent—level

Red No. 2A

A. 15 per cent—uniform coloring
B. 15 per cent—slightly duller than A
C. 100 per cent—dull, bluish cast
D. 100 per cent—bright and level
E. 95 per cent—bright and level
F. 100 per cent—bright and level
G. 90 per cent—bright and level
H. 85 per cent—bright and level
I. 85 per cent—bright and level

Green No. 3

A. 50 per cent—bright, bluish, level
B. 10 per cent—level
C. 80 per cent—uneven surface, dull
D. 100 per cent—duller and bluer than A
E. 80 per cent—level, yellow
F. 100 per cent—level
G. 100 per cent—duller than D
H. 65 per cent—level, yellow shade
I. 75 per cent—level, yellow shade

Blue No. 1

A. 100 per cent—red shade
B. 70 per cent—slightly mottled
C. 10 per cent—noticeable mottle
D. 50 per cent—green cast
E. 40 per cent—green cast
F. 45 per cent—duller than D
G. 40 per cent—green cast
H. 45 per cent—green cast
I. 40 per cent—green cast

Blue No. 2

A. Negligible
B. Negligible
C. 50 per cent—uniform dyeing
D. 100 per cent—level
E. 90 per cent—green cast
F. 95 per cent—slightly brighter than D
G. 90 per cent—dull
H. 90 per cent—red and bright
I. 100 per cent—red and bright

Violet No. 1

A. 100 per cent—red shade
B. 20 per cent—slightly mottled
C. 10 per cent—slightly mottled
D. 100 per cent—blue shade
E. 60 per cent—slightly mottled
F. 95 per cent—brighter than D
G. 50 per cent—slightly mottled.
H. 60 per cent—slightly mottled
I. 50 per cent—slightly mottled

Black No. 3

A. 50 per cent—green, full shade
B. 20 per cent—red shade
C. 80 per cent—red shade
D. 100 per cent—red shade, level
E. 95 per cent—gray shade
F. 100 per cent—red shade
G. 80 per cent—gray
H. 80 per cent—gray
I. 80 per cent—gray

Brown No. 1

A. 60 per cent—yellow, level
B. 10 per cent—yellow, level
C. 100 per cent—red, brown
D. 90 per cent—yellow
E. 95 per cent—red
F. 90 per cent—red
G. 100 per cent—red
H. 95 per cent—yellow
I. 95 per cent—yellow

Let us consider the information which we have compiled concerning this problem in absorption, as an entirety. In papers where it is necessary to use size and alum, the addition of (1) color (2) size (3) alum, or (1) size (2) color, (3) alum, display the most consistent results. The samples which were tested show with only two exceptions that the addition of size and alum as mordants is beneficial to the absorption of color.

The lower color retention where the rotation (1) alum, (2) size, (3) color, is used is of special interest as are the results of the G group tests. An increase of from ten to sixty per cent color usage cannot be disregarded when the advantages to be derived otherwise from any set method of addition, are practically nil.

It was noted that rather curious and unexpected reactions took place in two instances, namely, sheets prepared with Blue No. 1, and Violet No. 1, without the addition of size and alum. These are both basic colors and it has heretofore been common belief that due to lack of lignin and other impurities in this type of fiber the color would not hold satisfactorily. The knowledge derived is of particular value where high colored specialties are made and sized after the sheet has been dried.

We also determined that these two basic colors displayed more retentive action with size than with alum alone, while Brown No. 1 gave exactly opposite results. As all three colors belong to the same group this proves that no rule governing additions may be applied to any one division.

It is interesting to note in the Acid group that Red No. 2 shows the same retention when the additions are one alum, two size, three color, as when one color, two size, three alum, are added in that rotation.

The data obtained regarding Black No. 3 furnishes positive proof that it is necessary to use salt and heat, either with or without size and alum to produce maximum retention.

We determined by further tests that the most expedient method of applying basic colors is to affix the size first, allowing it sufficient time to thoroughly mix with the fiber. The color is then added, and the protective covering of rosin soap serves to diffuse the dyestuffs, eliminating dark colored fibers. Alum is applied finally to complete the fixation of color.

Hydration

The brushing out of wood and rag fiber in the beater, commonly termed hydration, is a factor in color manipulation which merits consideration. Our investigation of this problem was prompted by a desire to determine if possible the actual increase in color strength which continued beating produces. In beater rooms where there is little control of the time of hydration the shade of the finished material will fluctuate sometimes as much as 30 per cent even when all the materials entering the process are accurately weighed.

We accordingly furnished each beater with one pound of dyestuff per thousand pounds of unbleached sulphite. Size and alum were added and samples taken at intervals of one half, one, two, four, and eight hours. Extreme care was observed to have the relation of the beater roll to the bed plate identical in each test.

Red No. 1 and Green No. 1 on the basis of samples taken after the first half hour, became duller and increasingly translucent while the color value increased as follows: One hour less than 5 per cent, two hours 10 per cent, four hours 30 per cent, and at the end of 8 hours 40 per cent.

Blue No. 2B followed the results of the preceding colors except at the end of four hours when the increase was only 20 per cent, and after eight hours, 50 per cent.

Red No. 2 and Yellow No. 3A exhibited strength increases identical to those of Blue No. 2B with the exception of the samples taken at the end of an 8 hour interval. These were approximately 30 per cent deeper than the one half hour dyeings.

While the hydration of fiber and the resultant increase

in color value cannot strictly be termed as either absorption or adsorption, it is closely connected and we believe an indispensible part of the inquiry. The development of color in the beater to its maximum strength varies in accordance with the chemical structure of the dyestuff. A color such as Blue No. 2 required approximately forty-five minutes to become fully developed. As the paper fiber passes a certain point in beating time it develops a translucent appearance which accentuates the apparent color value. The shade at the same time becomes proportionately duller. It was determined by examination that the colors which we have listed are all fully developed in ninety minutes of beating time. This figure allows a factor of safety to take care of any local condition which may arise.

Colloidal Action

Chemically prepared paper stock is considered to be negatively charged. Dyestuffs on the other hand are charged both negatively and positively, depending upon their chemical makeup. If a negatively charged color is placed in contact with paper fiber there is no attraction and the use of a mordant is necessary to attach the color to the fiber. Inversely if the dyestuff is positively charged the colloidal action is immediate and the completeness of absorption dependent upon the strength of the charge which the color contains.

To determine the polarity of the pure colors which we are considering, apparatus was set up consisting of 500-cc. glass beakers, a wooden rod from which were suspended strips of rag waterleaf paper one inch wide and seven inches in length. These papers were immersed to seven sixteenths of an inch in 400 cc. of the various color solutions. The dye solutions were made up one gram per 1000 cc. of distilled water. In the following table are noted the rise of color above solutions, and also of the water above colors.

	Color above solution	Water above color	Color above solution	Water above color	Color above solution	Water above color	Color above solution	Water above color
Time of Immersion ...	20 min. inches	20 min. inches	1 hour inches	1 hour inches	3 hours inches	3 hours inches	4 hours inches	4 hours inches
Red No. 2.....	2½	1/16	3¾	1/8	3⅞	0	3⅞	0
Red No. 2A....	1	1 1/16	1⅝	2⅛	2	1⅜	2⅛	1¼
Green No. 3....	2 1/16	1¼	3 1/16	9/16	3 1/16	⅛	3½	⅛
Blue No. 1.....	1/16	1 1/16	1⅝	2⅛	2 1/16	1 1/16	3⅝	⅜
Blue No. 2.....	2¾	1/16	3⅞	0	4	0	4	0
Blue No. 2B....	3 1/16	⅛	3 1/16	0	3 1/16	0	3 1/16	0
Violet No. 1....	½	2 1/16	1⅜	2 1/16	2⅝	1⅜	3⅝	1/16
Black No. 3....	2 1/16	1	3¼	1/16	3½	¼	3½	¼
Brown No. 1...	1/16	1 1/16	1/16	1 1/16	1/16	1 1/16	1/16	1 1/16

Considering the data which we have collected it will be found that the Red No. 2, Blue No. 2 and Blue No. 2A show definitely negative reactions. This is indicated by the rise of color with the water due to capillary action and also the absence of coagulation at the surface of the dye solution.

Blue No. 1, Violet No. 1, and Brown No. 1 precipitated upon the fiber at the point of immersion allowing the colorless water of solution to ascend the strip of paper. We may state then, that the latter group of dyestuffs are charged positively. The rest of the colors which were included in the test lie between the two extremes.

As the strips are allowed to stand suspended over the beakers the capillary absorption by the paper gradually breaks down the polar resistance of the color to such an extent that at the end of a four hour interval the difference between the height of the color and water has been substantially decreased. This brings us to a consideration of prime importance. If such a reaction does take place it is logical to expect that a reversion of the polarity of the paper fiber will assist in the absorption of dyestuff. Papers impregnated with aluminum oxyhydrate were immersed in Blue No. 1 and Violet No. 1. It was found that the color rose immediately on the paper keeping pace with the water of solution. Red No. 2 and Blue No. 2 were also tested and found to be inverted, the color precipitating at the surface and the water rising colorless on the sheet.

Barium chloride and aluminum chloride were tested experimentally and found to assist in reversing the polar action of certain dyestuffs. In order to determine the actual effect which these chemicals have, we prepared a series of dyeings.

1. 25 pounds color
2. 25 pounds color, 25 pounds barium chloride
3. 25 pounds color, 25 pounds aluminum chloride

All per thousand pounds of kraft fiber with two per cent size and three per cent alum.

The results and the increase or decrease in retention of color are compared against the first series.

Red No. 1
2. 20 per cent increases in depth—same shade
3. 20 per cent increase in depth—dull-blue cast

Orange No. 2
2. 10 per cent increase in depth—same shade
3. 20 per cent increase in depth—same shade

Yellow No. 2
2. 10 per cent decrease in depth—mottled appearance
3. 5 per cent decrease in depth—mottled appearance

Green No. 2
2. 5 per cent decrease in depth—blue shade
3. 5 per cent decrease in depth—blue shade

Blue No. 2A
2. 10 per cent increase in depth—brighter shade
3. 10 per cent increase in depth—brighter shade

Blue No. 2B
2. 10 per cent increase in depth—redder shade
3. 10 per cent increase in depth—redder shade

These figures indicate an increase in retention on the part of several of the acid dyestuffs and an examination of the water coming through the sheet forming wire corroborates this observation. When it is necessary to use excessive quantities of acid colors, these results would indicate that it is advisable to add either aluminum chloride or barium chloride. The latter is the most desirable since aluminum chloride is hygroscopic.

Destructive Chemicals

Difficulty is constantly encountered in paper mills due to impurities entering the manufacturing process. We shall consider some of the most important such as tannic acid and fermentation products contained in groundwood; acid and alkali residues collected in the preparation of pulp water supply, oxidation and reducing action due to localized imperfections of process and the presence of chlorine in poorly washed bleached stock. Each color reacts somewhat differently to these extraneous influences, so we have investigated those which are encountered most often and also their reactions upon a representative list of colors.

Calcium compounds that are evident in the water supply of many large mills serve to precipitate and retard the action of dyestuffs. It was determined in the laboratory that a lowering of the pH before the addition of color served to neutralize the action of these substances and permit application of dyestuff without excessive loss of color value. Mill tests were made using several basic colors with positive results.

Residual chlorine, showing up infrequently in mills pro-

Color	10% H_2SO_4	28% $HC_2H_3O_2$	1/5 N NaOH	NH_4OH & Zn	Oxidation
Red No. 1	Purple	Slight loss of color	Dull blue	Transparent pink	Original color.
Red No. 2	Blue	Loses color	Red brown	Transparent reddish yellow	Dark brown.
Red No. 3	Blue	Purple	Loses color	Colorless	Colorless.
Orange No. 1	Red orange	Loses color	Green yellow	Colorless	Dull brown
Orange No. 2	No change	No change	Red	Golden yellow	Russet.
Orange No. 3	No change	No change	Loses color	Cloudy pale yellow	Dull yellow
Yellow No. 1	Loses color	No change	Loses color	Colorless	Light yellow.
Yellow No. 2	Colorless	Loses color	Loses color	Golden yellow	Orange.
Yellow No. 3	Dark brown	No change	No change	Transparent pale green	Red yellow.
Green No. 1	Yellow	No change	Loses color	Milky white	Original color.
Green No. 2	Loses color	No change	Loses color	Cloudy colorless	Original color.
Green No. 3	Violet	No change	Loses color	Cloudy colorless	Original color.
Blue No. 1	No change	No change	Red blue	Colorless	Pale blue.
Blue No. 2	Purple	Loses color	Green blue	Wine red	Dull blue.
Blue No. 3	No change	No change	Reddish blue	Pale yellow	Light pink.
Violet No. 1	Yellow	Green blue	Gray	Transparent	Colorless.
Violet No. 2	Green	Dull blue	No change	Light blue	Light green.
Black No. 2	Blue gray	Light gray	Plum color	Dull green	Original color.
Black No. 3	Red black	Red black	Blue	Green yellow	Blue.
Brown No. 1	Yellow brown	Loses color	Red yellow	Colorless	Red.

ducing their own bleached stock, has a decidedly detrimental effect upon color absorption. We found in the laboratory that the addition of a trace of chlorine to bleached sulphite increased the color usage necessary to produce a given shade from fifty to two hundred per cent. In one instance of practical color application a small quantity of chlorine was found to be present and the color value decreased over one hundred per cent. The use of chemicals in the beater to overcome this action caused foam which was objectionable on the paper machine.

The most satisfactory method of eliminating chlorine consists of washing the stock thoroughly, carrying it in a trough over as long a distance as possible and then allowing it to rotate in the beater for at least one hour before adding color.

Tannic acid is sometimes used with basic colors to produce fast to light shades, forming a lake which is usually weaker and noticeably duller. As we mentioned previously, tannic acid is contained in groundwood stock in sufficient quantities to affect basic colors which are used to dye this type of fiber.

Red No. 1 becomes duller, approximately ten per cent weaker and bluer in shade when one per cent tannic acid is added to a furnish of eighty per cent ground wood and twenty per cent unbleached sulphite. Other colors under the same conditions show the following results:
Orange No. 1, duller—20 per cent weaker.
Green No. 1, duller—bluer and 10 per cent weaker.
Blue No. 1, duller—redder and 5 per cent weaker.
Violet No. 1A, duller—same shade and 5 per cent weaker.

This change in color is important, as the amount of tannic acid contained in groundwood and also the water supply varies over a wide range during different seasons of the year. No satisfactory method of eliminating this material economically has yet been determined.

Penetration

Paperboard manufacturers are confronted with the following problem in the calendar coloring of their products:

The average sheet of board is not sized uniformly, consequently the penetration of a water solution is rarely uniform. The fact that color penetrates deeply at one point and hardly touches the surface at another produces a streaked, mottled result.

We considered three types of penetration assists and their reaction on basic and acid colors.

Methanol serves to increase the solubility of basic colors, aids in quick drying, and will also break surface sizing in a sheet of board.

Since rosin size is soluble in alcohol it is not advisable to use this product where the board must ultimately show a certain degree of water resistance.

Soap chips, due to their solubility in water and the stearates which they contain, form a vehicle which aids in spreading the color evenly over the surface.

Sulphonated oil of the double sulphonated type is prepared by placing castor oil in a vat lined with cooling tubes and allowing sulphuric acid to drip into it over a period of forty-eight hours. This type of oil does not contain the impurities present in the ordinary turkey red oil which is prepared by dumping a quantity of sulphuric acid into castor oil without consideration of temperature control or consequent sulphonation.

Practical tests proved that alcohol and soap may be used separately or in conjunction with one another to produce uniform dyeing with basic colors. The action of these two products upon the acid group, however, produced unsatisfactorily colored board.

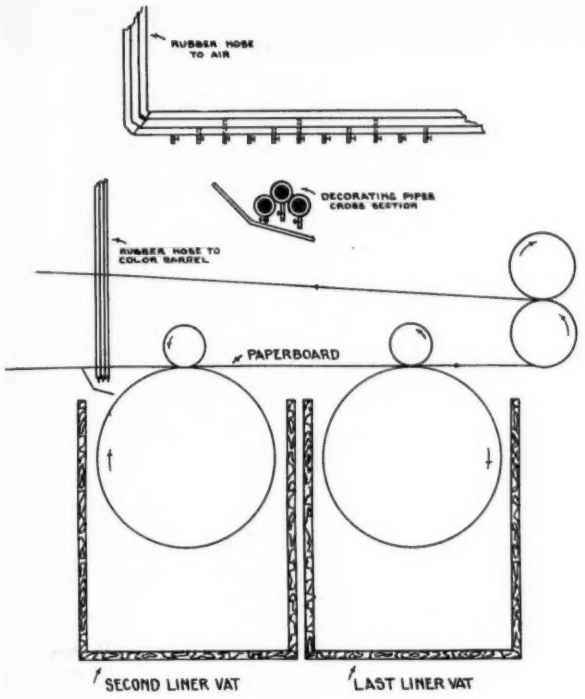
Sulphonated oils used in combination with Yellow No. 1, Blue No. 1, Violet No. 1, and Green No. 1, both in the laboratory and plant caused precipitation of dye, reducing the coloring effect practically to zero. Acid colors such as Red No. 2, Orange No. 2, Yellow No. 2, and Green No. 2 reacted favorably with the oil. The shade of each of these is changed slightly, but not sufficiently to be detrimental to the production of attractive results. We determined that the amount of sulphonated oil necessary to insure satisfactory results varies directly with the sizing of the sheet, from a minimum of two ounces per ten gallons of water to a maximum of two pounds for the same amount of solution. It is naturally unwise to add any more than is absolutely necessary to drop the color solution through the liner of the laminated board, since excessive saturation of the board will cause difficulties in machine manipulation and also impart an undesirable quantity of moisture to the finished sheet.

In connection with this investigation we were able to devise an apparatus suitable for specialty coloring on a paper board machine. The apparatus Fig. 1 consisted of three pipes, one inch in diameter, and running the width of the paper machine. Nozzles were attached to each pipe at staggered intervals of three inches. The pipes were connected to an angle iron, running the width of the machine, in such a way as to allow the color to drip from the nozzles to the iron and thence onto the paperboard. This equipment was attached to three barrels of color solution suspended at a height of ten feet by means of rubber hose to one side of the machine, and on the other side hose was also attached and carried above the level of the barrels to equalize the pressure. The most desirable point of application, shown in the accompanying sketch, was found to be in the front of the next to the last vat. By placing it at that point, the color solution was deposited between the top and second sheets of the laminated board. As the sheets are pressed together the color is also spread out and diffused.

Red No. 2, Yellow No. 2, and Blue No. 2, which we had previously determined to be negatively charged, produced a pleasing color "cloud" effect on a white background. Basic colors were also tried, but the absorption was intsantaneous and the resultant sheet unsightly.

Discusion of Results

As the presentation of various tests made in the labora-



DECORATING APPARATUS FOR PAPERBOARD

FIG. 1

tory and plant have been completed, we have endeavored to consider individually their possible application and the benefits to be derived.

The rotation of materials which are applied in the process of stock preparation is an important factor in paper mill practice since it would obviously incur no additional expense to adapt this information to meet local conditions. It is well to repeat the observation which we made on a previous page, that under normal conditions any change in rotation will not affect the physical characteristics of the sheet.

Since colors must adapt themselves to materials which are used in combination with paper fiber, the action which these auxiliary substances have on the various dyestuff groups is important to the production of a perfect sheet of paper. The results of these tests are, therefore, of interest to the practical mill superintendent.

Hydration of stock by means of beating and its effect on the shade of colors is of particular value to mills which now condone slipshod methods in the beater room. The change in color also serves as an indication of the manner in which the sheet is processed and any variation in shade denotes uneven physical characteristics.

The colloidal reaction between dyestuff and paper fiber is a complete study in itself. The results which we have obtained, however, are sufficient to convince us of the desirability of continuing our investigation of this subject. It is reasonable to expect that various chemical compounds sufficiently low in cost for this work may be found.

Destructive action by contaminating agents present in the system is a problem which seriously impedes the manufacture of a satisfactory product. While care will overcome a number of these deleterious reactions, the presence of various chemicals in the converting process, and also connected with the ultimate use of some papers make such information important.

The advantages of calender coloring which we enumerated are all dependent upon a perfect finished product. By following the methods of inducing penetration which have been determined as the best available, satisfactory results are obtainable at a nominal cost.

The manufacture of paper is a bulk process, the life of the finished product is comparatively short, and the price is correspondingly low. It is obvious then that any changes must not increase the cost excessively if they are to earn serious consideration. On account of this fact we have been somewhat limited in choosing chemical compounds which will aid and abet the absorption of dyestuffs.

We believe, however, that the information contained herein is a step toward the better understanding of a phase of paper engineering which is only in its infancy. The ever increasing importance of color to the industry is brought home by the fact that many consumers now place color requirements before the physical properties of the paper.

The manufacturers of dyestuffs are constantly improving their products, while the scientific use of chemicals in the paper mills is progressing rapidly. It is our opinion that during each succeeding year new problems in the correlation of dyestuff and paper to produce perfect absorption, will offer extraordinary opportunities for further experimentation.

Acknowledgment

The author wishes to express his appreciation for the assistance and cooperation which he received from C. A. Brautlecht, of the Univ. of Maine; W. H. Cotton, and O. T. Chalon, of the General Dyestuff Corporation; and also from friends connected with the paper industry in various capacities.

TAPPI Notes

The Fourteenth Exposition of Chemical Industries which will be held in the Grand Central Palace, New York City, December 4 to 9, 1933, will have a packaging section.

Charles W. Rivise, patent attorney, Philadelphia, Pa., and chairman of the TAPPI Patents Committee has just written a book entitled, "The Preparation and Prosecution of Patent Applications." It is published by the Michie Company, Charlottesville, Virginia, and is available at $7 per copy.

Leon S. Dixon, consulting engineer, has established a New York city office and may be reached through General P. O. Box 301, New York.

J. C. Nutter, formerly with Canadian Paperboard Company Ltd., is now with Bennett Ltd., Chambly Canton, P. Q.

The A. S. M. E. and A. I. C. E. will conduct a course in chemical engineering, free to graduate chemical engineers, in the Engineering Societies Building, 29 West 39th Street, New York, Monday evenings, beginning December 4.

The next meeting of the New England Section of TAPPI will be held at the Nonotuck Hotel, Holyoke, Mass., Friday evening, December 8, 1933, at 6:30 P. M. The speaker will be Albert S. Osborn of New York, one of the country's outstanding handwriting and forged document experts.

The German TAPPI will hold its next meeting on December 7, 1933, at the association headquarters in Berlin.

N. C. Flint To Be Manager

N. C. Flint has become manager of the mill of the Eddy Paper Corporation, Three Rivers, Mich., and will also be in charge of operations of the Detroit corrugated paper plant and Chicago Quick Service Box Co., Chicago, Ill., affiliated organizations. He will succeed J. H. Conway, acting manager since the death of J. M. Monahan, who has been transferred to the Rockford mill of the company.

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Paper Specialties

Waterproofed Products from Fibrous Pulps. Flintkote Co. Brit. pats. 359,902 and 359,950 (July 21, 1930). —*No. 359,902*—Products such as roofing, buckets or tops for vehicles are formed from a mixture of aqueous fibrous pulp and an aqueous dispersion of waterproofing material such as asphalt which is precipitated on the individual fibers by forming a fixing agent in the mixture at a pH corresponding to the isoelectric point of the fixing agent. Sodium resinate and alum or sodium silicate and alum may be used as fixing agents, and various details of procedure are described. *No. 359,950* relates to the manufacture of products from similar material by use of suction or pressure.—A P.-C.

News Print Paper. W. G. MacNaughton. Pulp Paper Can. 34, 17-19, 71-73, 169-173 (Jan., Feb., 1933).—A discussion of pressroom performance, and printing quality, together with a review of the progress effected in the course of the past 30 years in manufacturing control.—A. P.-C.

Manufacture of Sensitive Papers. V. Antoine. Belg. pat. 388,669 (June 30, 1932).—Gelatin or casein is added to the stock in the beater in order to give the paper the required waterproofness; a solution of sensitizing metallic salts is applied to the sheet of paper as it is being formed, the surface of the rolls coming in contact with the impregnated face of the paper are jacketed with nickel, aluminum or stainless steel—A. P.-C.

Paper Resistant to Aging. George A. Richter assignor to Brown Co. U. S. pat. 1,880,045 (Sept. 27, 1932).—A paper resistant to aging in the atmosphere contains a stable powdered cellulose derived from cellulose fiber practically free from non-cellulosic material such as lignin and resin.—A. P.-C.

Product for Waterproofing Paper. E. I. duPont de Nemours and Co. Fr. pat. 691,915 (July 22, 1930).—Paper is waterproofed by means of a solution of polymerizable or polymerized derivatives of ethylene or of polyolefines, or their homologues or derivatives, such as metastyrene, preferably in combination with a modifier.—A. P.-C.

Regenerated Cellulose Cigaret Paper. La Cellophane. Fr. pat. 735,680 (July 16, 1931).—Cigaret paper is made from regenerated cellulose (cellophane), which is either made without the use of plastifiers, or from which the plastifiers have been removed by washing, and which is conditioned to about 10 per cent moisture content.—A. P.-C.

Composition Suitable for Waterproofing Paper or Pulp Tubes, Etc. Everett W. Lovering assignor to Brown Co. U. S. pat. 1,880,036 (Sept. 27, 1932).—Previously blown petroleum asphalt 80 to 90 parts, rubber 5 to 15 parts, and waxy material such as beeswax about 5 parts, are heated together.—A. P.-C.

Impregnated Cigaret Paper. Ernest W. Desper. U. S. pat. 1,879,128 (Sept. 27, 1932).—Paper is used which is impregnated with a tungstate (such as sodium tungstate) and a sulphate (such as ammonium sulphate) (forming tungstic oxide when the paper is burned), and a borate such as boric acid and a phosphate (such as ammonium phosphate) which form a cement holding the particles of oxide produced in the form of a heat-insulating enclosure for the burning filler.—A. P.-C.

Impregnating Tubes of Pulp or Other Fibrous Material with Thermoplastic Material Such as Pitch. Milton O. Schur assignor to Brown Co. U. S. pat. 1,880,050 (Sept. 27, 1932).—Molten material such as pitch containing associated solid or gummy components is subjected to treatment such as in a colloid mill in order to reduce such components to particles of impalpable fineness, and the molten material is then used for impregnating fibrous substances.—A. P.-C.

Vulcanized Fiber. Ernst Becker assignor to I. G. Farbenindustrie A.-G. U. S. pat. 1,879,031 (Sept. 27, 1932). —Paper is parchmentized with sulphuric acid to which a sulphate soluble in sulphuric acid, such as ammonium or magnesium sulphate, is added and which serves as a reaction regulator and retarder.—A. P.-C.

Molded Articles of Cellulosic Compositions. K. Kurschner. Brit. pats. 347,807 (March 4, 1929), 348,791 (Feb. 4, 1930).—*No. 347,807*—Pulverized wood or the like is mixed with a binder such as xanthogenated cellulose, cuprammonium cellulose or nitrocellulose, the material is shaped under pressure, and the cellulose compound is transformed into free cellulose by chemical treatment. *No. 348,791*—In a modification of the previous process wood pulp containing a large proportion of long fibers is treated as customary in the manufacture of paper, and is impregnated with a dissolved cellulose compound after or during a preliminary or final molding process, forming part of the paper-making treatment, and the cellulose compound is converted into hydrocellulose at a later stage of the process.—A. P.-C.

Adhesive. Wm. R. Willauer, assignor to Marathon Paper Mills Co. U. S. pat. 1,883,209 (Oct. 18, 1932).—An adhesive which is suitable for use in forming joints in sulphurized fiber board is prepared by mixing 200 parts of dry casein to 10 to 60 parts of dry sulphur and adding a solution of water and alcohol to form a liquid suspension. —A.P.-C.

Method of Making Paper. W. Voith, H. Voith and H. Voith, trading as J. M. Voith. Brit. pat. 356,294 (June 8, 1929).—Fibrous materials are blown by compressed air onto the wire or felt of a draining apparatus for the manufacture of paper, to effect uniform distribution of stuff of any desired consistency. Various details of apparatus are described.—A. P.-C.

Mold for Fiber Board. Francis S. Farley, assignor to Daniel Manson Sutherland, Jr. U. S. pat. 1,883,888 (Oct. 25, 1932).—Air-vents are provided in the platens of the press in which the sheet is formed and pressed. Each vent is controlled by a valve, which is closed after the mold is charged with pulp and opened again after the sheet has been removed.—A. P.-C.

Process for the Production of Single- or Double-faced Boards. Alois Ederer. Fr. pat. 740,951 (Aug. 8, 1932).—The core or filler portion of the board is formed on a wet machine and pressed. The facing or liner is formed on a cylinder machine, and the still moist filler is applied thereto just in front of the nip of the press, so that the two are pressed together. When two facings or liners are used they are brought together just before being pressed, and the filler is placed between them at this point.—A. P.-C.

Panel Board. Elbert C. Lathrop and Fergus A. Irvine, assignors to Celotex Co. U. S. pat. 1,881,418 (Oct. 4, 1932).—A hard, dense, board-like material is made from wood, straw, bagasse, etc., by separating the raw material into fiber bundles and fibers with subsequent washing, sheeting and compacting under high pressure with simultaneous high-pressure steam treatment under highly buffered alkaline conditions.—A. P.-C.

Apparatus for the Manufacture of Sheet Material. Horatio W. Brown, assignor to Bemis Industries, Inc. U. S. pat. 1,873,279 (Aug. 23, 1932).—The invention relates to machines for making artificial lumber from material such as excelsior bound by an oxychloride cement, which is made into sheet form by passing between series of rolls. Each pair of rolls is driven by means of oppositely-pitched worms mounted on a common vertical shaft and meshing with worm gears secured to the ends of the rolls. The rolls are provided with circumferential grooves to receive any surplus binder that otherwise might be squeezed out at the ends of the rolls and be wasted.—A. P.-C.

Waterproofing Board. Judson A. DeCew, assignor to Process Engineers, Inc. U. S. pat. 1,882,212 (Oct. 11, 1932).—Material such as sheeted pulp is built up in laminations to the desired thickness in a wet-press machine, dried, impregnated by immersion in a melted composition of rosin containing wax and pressed while hot to a specific gravity of over 1.2.—A. P.-C.

Pulpboard. H. L. Becher. Brit. pat. 354,001 (July 13, 1929).—Material such as raw wood fiber, chemically digested wood fiber, straw, bagasse, etc., is freed from the bulk of associated water and is then heated to remove interstitial water, without any substantial application of pressure, and is then subjected to heat and pressure to remove water colloidally associated with the fibers, and may be combined with a binder such as montan wax, sulphur, shellac, mineral pitch, asphalt, gilsonite, china wood oil, resins, lignins, sizes, etc., for making pulpboard by hot pressing.—A. P.-C.

Treating Paper with Viscose. Milton O. Schur, assignor to Brown Co. U. S. pat. 1,880,286 (Oct. 4, 1932).—Waterleaf paper is treated with a viscose solution capable of yielding regenerated cellulose upon drying alone, and the paper is dried to effect such regeneration.—A. P.-C.

Stencil Sheets. Shinjiro Horii. Brit. pat. 360,675 (Nov. 10, 1930).—Japanese yoshino paper is coated with a composition comprising a mixture of esters of polysaccharides such as cellulose acetate, cellulose nitrate, starch acetate, starch palmitate or mannan acetate with naphthenic acid glycerides and a heavy hydrocarbon oil.—A. P.-C.

Apparatus for Coating Paper. William J. Eisner, assignor to Newark Paraffine and Parchment Paper Co. U. S. pat. 1,880,078 (Sept. 27, 1932).—The paper is passed through a bath of coating material such as paraffine, wax, gum, sizing, coloring, clay, etc., on emerging from which it passes successively through a press that removes excess of coating agent, through a bath of water to set the coating, over scrapers which remove the adhering water, and finally around a number of rolls to air-dry the coated sheet.—A. P.-C.

Lacquering and Impregnating Paper with Artificial Resins. Ernst Elbel and Fritz Seeback, assignors to Bakelite G.m.b.H. U. S. pat. 1,880,930 (Oct. 4, 1932).—The paper is treated with finely comminuted artificial resins together with drying oils such as linseed-oil varnish.—A. P.-C.

Rubbered Paper As Insulating Building Material. L. D. Meunier. Belg. pat. 387,743 (July 30, 1932).—Rubber is applied to a sheet of paper by means of pressure and heat.—A. P.-C.

Uniting Felt Roofing. Albert C. Fischer assignor to Philip Carey Manufacturing Co. U. S. pat. 1,881,435 (Oct. 11, 1932).—The surface of asphalt-treated felt roofing is provided with an asphalt absorbent material such as metallic soap, and another surface of material carries a substance containing an ingredient such as an oil composition adapted to be transfused into the asphalt absorbent substance to form an adhesive, and the treated materials are united.—A. P.-C.

Coated Material for Use on Floors, Walls or Roofs. Durastic Bituminous Products, Ltd., and W. B. Thompson. Brit. pat. 353,910 (April 29, 1930)—Building felt is coated on one side with a suitable bitumen or other material adapted to serve as an adhesive when heated, asphalt or the like is applied to the other side of the sheet, as in roofing or like uses.—A. P.-C.

Protecting Materials Such As Building Boards from Termites, Etc. Treadway B. Munroe and Elbert C. Lathrop, assignors to The Celotex Co. U. S. pats. 1,880,971 and 1,880,972 (Oct. 4, 1932).—*No. 1,880,971*—The fibrous material from which the product is formed is treated, while in the form of an aqueous suspension, with emulsified chloronaphthalene, and subsequently a demulsifying agent such as alum is added to precipitate the chloronaphthalene on the fibers. *No. 1,880,972* relates to water-, insect- and fungus-proofing fibrous material with a complex colloid containing iron, arsenic and rosin, such as may be formed from arsenious oxide, rosin size and ferric chloride.—A. P.-C.

Pulp Product and Its Manufacture. Daniel Manson Sutherland, Jr. U. S. pat. 1,884,366 (Oct. 25, 1932).—The invention provides means for producing an insulating board having its surface roughened with projections. This is obtained by pressing and drying the sheets, formed on a wet machine, in a drying press such as covered in Sutherland's patent 1,506,789, of Sept. 2, 1924; but the heated pressing plates are provided with a series of channels or grooves on one of their faces, so that during the pressing the fibers fill the grooves partially, but not completely.—A. P.-C.

Method of and Machine for Making Thick-Butt Roofing. Chester R. MacDonald, assignor to The Patent and Licensing Corp. U. S. pat. 1,890,017 (Dec. 6, 1932).—A web of roofing stock is supported along its center on a conveyor, so that the edges are free to bend down, or are forced down; and while in this condition it is passed through a bath of molten asphalt.—A. P.-C.

Metal-Clad Roofing of Fibrous Material. W. M. Shakespeare, assignor to International Copperclad Co. Brit. pat. 348,128 (Dec. 29, 1928).—A fibrous material of the general type of Celotex or the like is united with a metal coating by an intervening layer of asphalt or the like.—A. P.-C.

Coating Machine for Shingles. Gilbert J. Snyder, assignor to The Patent and Licensing Corp. U. S. pat. 1,-

870,426 (Aug. 9, 1932).—The shingles while in a horizontal position are gripped by jaws which carry them through a bath of molten asphalt, the shingles assuming a vertical position as they pass through the bath. On leaving the bath the shingles revert to a horizontal position, are coated on one side with powder (*e. g.*, talc or soapstone) and on the other side with grit and are finally pressed to force the grit into the asphalt coating.—A. P.-C.

Manufacture of Paper Material Resembling Leather. J. Knaggs, J. C. Marsden and Portals, Ltd. Brit. pat. 380,739 (April 1, 1932).—Waterleaf paper made from flax, cotton, etc., is sized with gelatine (without alum), treated with formaldehyde, optionally in conjunction with a softening agent such as magnesium chloride, and after seasoning and air-drying is coated with a cellulose lacquer under condition which permit recovery of the lacquer solvents.—A. P.-C.

Cigaret Paper. Papeteries de Malaucène, Soc. Anon. Fr. pat. 733,263 (May 15, 1931).—The paper is impregnated during manufacture with sodium oxalate or sodium carbonate.—A. P.-C.

Incorporating Rubber Latex with Paper During Manufacture. General Rubber Co. Brit. pat. 356,310 (June 11, 1930).—Rubber latex is mixed with pulp in the beater and the rubber is deposited in finer particles and a more stable pulp mix is obtained by adding a protective colloid such as acetylated starch ("feculoid" or "feculose"), glue or casein in small proportion, after which the material is made alkaline to litmus with ammonia, sodium silicate or other alkali and the beating operation completed. A coagulating agent such as alum or zinc sulphate is then added in successive portions. If glue is used, coagulation is preferably effected with a protein precipitant such as a heavy metal salt, tannic acid, etc.—A. P.-C.

Manufacture of Cigarette Papers. Soc. Anon. des Anciens Etablissements Braunstein Frères. Brit. pat. 380,724 (March 12, 1932).—Suitable paper is obtained by incorporating 2 to 8 per cent of a stearin compound (sodium stearate) with the pulp and precipitating the stearin by addition of oxalic acid to a pH value of 6. The process-water should be pretreated with oxalic acid to a pH value just below 7 to precipitate calcium salts.—A. P.-C.

Process for the Manufacture of Waterproof Papers and Boards. A. Braun. Belt. pat. 388,039, (July 30, 1932).—Water-repellent impregnating agents are added to the stock and precipitated on the fibers by means of suitable reagents, and the stock is then sheeted on a paper machine.—A. P.-C.

Waterproof Wrapping Paper. A. Raymond. Belg. pat. 389,492 (July 30, 1932).—Paper is waterproofed by applying, by means of a pair of rolls one of which is partly immersed in the impregnating bath, to one or both sides of the sheet a solution of raw rubber, latex, or synthetic rubber which is spontaneously coagulable in the air.—A. P.-C.

Compositions for Admixture with Pulp or Fiber for Manufacture of Waterproof Paper or Pulpboard. Agasote Millboard Co. Brit. pat. 341,416 (Oct. 11, 1929). Saponified montan wax is used as an emulsifying agent together with paraffin for preparing aqueous emulsions which may be added in paste-like form to pulp or fiber in a beater (suitably after preliminary mixing aluminum or magnesium sulphate if desired) or used as a surface coating.—A. P.-C.

Fiber Product Preservation. Elbert C. Lathrop and Fergus A. Irvine, assignors to The Celotex Co. U. S. pat. 1,880,965 (Oct. 4, 1932).—During the manufacture of products such as felted sheets, the material is treated with a slurry comprising a metalloid of the "arsenic family," such as may be formed from sodium arsenite and thrown down as a complex with a metallic element such as alum producing a gelatinous hydroxide or basic gelatinous salts and precipitated by an alkali such as calcium hydroxide. —A. P.-C.

Iodide Paper for Telegraphic Recording. V. Bausch, T. Bausch and F. Bausch. Brit. pat. 351,465 (March 24, 1930).—To prevent separation of iodine during storage from iodide receiving paper, a reducing agent such as "Rongalit" is added to the paper in a proportion much smaller than that of the iodine (suitable only about one per cent as much).—A. P.-C.

Sheet Material for Electrical Insulation. Allgemeine Elektricitäts Gesellschaft, assignor to International General Electric Co. Brit. pat. 341,535 (Oct. 19, 1928).—Insulating sheets are formed of a fabric made from threads of spun paper impregnated with a binder such as a varnish containing oils, natural or artificial resins, phenol-formaldehyde condensation products, glycerol-phthalic anhydride condensation products or the like, which may include cellulose esters or ethers, etc.—A. P.-C.

The Manufacture of Pulp Insulated Wire. J. S. Little. Paper Trade J. 96, No. 8; 29-32 (Feb. 23, 1933). —A narrow ribbon of pulp with a wire imbedded in it is made on a machine of the cylinder type. The ribbon is rolled around the wire while wet and after drying forms a continuous electrical insulation for the conductor.—A. P.-C.

Molded Products from Cellulosic Material. Frederick H. Smyser assignor to The British Thomson-Houston Co., Ltd. Brit. pat. 360,637 (Oct. 22, 1930).—Cellulosic material such as sawdust, bagasse or cornstalks, having natural substances capable of yielding resinous compounds, is digested with caustic soda, and sulphuric acid is added to the digested mass to precipitate the dissolved resinous constituents, the material is filtered and the mass is washed until neutral, dried at about 80 deg. C. and there is added to the dried mass about 5 to 40 per cent of hydrated lime, the material is powdered and is molded under heat and pressure.—A. P.-C.

Strong Wrapping Paper. Harry H. Nelson and Guillaume Becker. Fr. pat. 735,525 (April 19, 1932).—Paper of high tensile strength suitable for packing is made by impregnating paper pulp with a cellulosic solution such as an alkaline solution of cellulose thiosulphocarbonate, on which an appropriate coagulating medium is caused to act, so as to precipitate hydrocellulose which acts as a binder for the fibers.—A. P.-C.

Composite Corrugated and Solid Fiber Board. Paul F. Boeye assignor to Waldorf Paper Products Co. U. S. pat. 1,896,037 (Jan. 31, 1933).—A sheet of solid fiber board is combined with a sheet of corrugated fiber board, by securing the two together along the convex tips of corrugations at given intervals, and the portions of the corrugated sheet between these corrugations are compressed and secured to the solid sheet.—A.P.-C.

Waterproof Fiber Boards. Harold L. Levine assignor to The Flintkote Corp. U. S. pat. 1,884,761 (Oct. 25, 1932).—A fibrous stock is mixed with an aqueous dispersion of thermoplastic waterproofing material such as asphalt, and the mixture is formed into a wet board on a paper machine. The board is shaped while wet, dried in shape, and subjected to heat and pressure. The process may be applied to the manufacture of articles such as those with thermo-molded cameo or intaglio effects.—A.P.-C.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 18, 1933

CIGARETTE PAPER

Champagne Paper Corp., Waukegan, Havre, 809 cs.; Champagne Paper Corp., Paris, Havre, 646 cs.; Standard Products Corp., Paris, Havre, 52 cs.; De Manduit Paper Corp., Pr. Roosevelt, Havre, 277 cs.

WALL PAPER

R. F. Downing & Co., Westernland, Southampton, 2 cs.; W. H. S. Lloyd & Co., Majestic, Southampton, 1 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., American Farmer, London, 5 bls.

NEWS PRINT

Parsons & Whittemore, Inc., St. Louis, Hamburg, 135 rolls; Perkins Goodwin & Co., St. Louis, Hamburg, 700 rolls; Jay Madden Corp., Pr. Roosevelt, Hamburg, 137 rolls; The Star Co., Markland, Liverpool, N.S., 819 rolls; N. Y. Tribune Co., Markland, Liverpool, N.S., 1549 rolls; World Telegram, Markland, Liverpool, N.S., 589 rolls; Ribbon & Ticker Paper Co., Markland, Liverpool, N.S., 14 rolls; B. J. Warren, Markland, Liverpool, N.S., 124 rolls; Clinton Paper Corp., Markland, Liverpool, N.S., 346 rolls; Lunham & Reeve, Sagoporack, Kotka, 2262 rolls; Gilman Paper Co., Sagoporack, Kotka, 146 rolls; Jay Madden Corp., Sagoporack, Kotka, 872 rolls; ——, Bergensfjord, Oslo, 397 rolls; Clinton Paper Corp., Bergensfjord, Oslo, 210 rolls; Perkins Goodwin & Co., Deutschland, Hamburg, 57 rolls.

PRINTING PAPER

Fuchs & Lang Manfg. Co., St. Louis, Hamburg, 7 cs.; Steiner Paper Corp., St. Louis, Bremen, 13 cs.; Ozalid Corp., Rotterdam, Rotterdam, 36 cs.; Architectural Forum, Deutschland, Hamburg, 6 cs.

WRAPPING PAPER

Jenkins Bors., Cameronia, Glasgow, 1 cs.; C. Steiner, Rotterdam, Rotterdam, 16 bls.; Sylvania Industrial Corp., Westernland, Antwerp, 1 cs.; Standard Products Corp., Westernland, Antwerp, 4 rolls, 3 cs.; Van Oppen & Co., Excambion, Genoa, 26 cs.; Meadows Wye & Co., American Farmer, London, 5 cs.; ——, Deutschland, Hamburg, 16 bls.

FILTER PAPER

A. Giese & Son, Majestic, Southampton, 92 bls.; H. Reeve Angel & Co. Inc., American Farmer, London, 14 cs.

FILTER MASS

Atlantic F'd'g. Co., St. Louis, Hamburg, 30 bls.; Mayer Bros., Co., by same, 75 bls.; A. Giese & Son, Deutschland, Hamburg, 30 bls.

METAL COATED PAPER

Globe Shipping Co., St. Louis, Hamburg, 68 cs.; K. Pauli Co., by same, 51 cs.; Rohner Gehrig Co., Deutschland, Hamburg, 23 cs.; Globe Shipping Co., by same, 56 cs.

PHOTO PAPER

American Express Co., St. Louis, Hamburg, 45 cs.; Chas. Happel, St. Louis, Bremen, 1 cs.

SURFACE COATED PAPER

Globe Shipping Co., St. Louis, Hamburg, 2 cs.; Globe Shipping Co., Deutschland, Hamburg 46 crates, 1 cs.; ——, by same, 10 cs.; Gevaert Co. of America, Westernland, Antwerp, 56 cs.

BASIC PAPER

——, St. Louis, Bremen, 26 cs.; P. Puttman, Westernland, Antwerp, 9 cs.

COATED PAPER

Chas. Happel, Pr. Roosevelt, Hamburg, 40 cs.; Chas. Happel, Deutschland, Hamburg, 3 cs.

DECALCOMANIAS

Sellers Transportation Co., Deutschland, Hamburg, 18 cs.; L. Consmiller, by same, 8 cs.; Sellers Transportation Co., St. Louis, Hamburg, 2 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Britannic, Liverpool, 11 cs., (duplex); B. F. Drakenfeld & Co., by same, 2 cs., (simplex).

WRITING PAPER

Japan Paper Co., Pr. Roosevelt, Havre, 5 cs.

ENVELOPES

Beckhard Simfred Co., Pr. Roosevelt, Hamburg, 11 cs.

STRAW BOARDS

American Paper Tube Products Co., Rotterdam, Rotterdam, 138 rolls; Cleveland Container Co., by same, 93 rolls.

CARD BOARD

R. Wilson Paper Corp., Rotterdam, Rotterdam, 35 cs., 52 rolls;

MISCELLANEOUS PAPER

——, St. Louis, Bremen, 7 cs.; Beckhard Simfred Co., Pr. Roosevelt, Hamburg, 2 cs.; Keuffel & Esser Co., by same, 74 cs.; Keller Dorian Paper Co., Paris, Havre, 7 cs.; C. Schleicher & Schull Co., Deutschland, Hamburg, 1 ble., 7 cs.

RAGS, BAGGINGS, ETC.

——, E. Francqui, Antwerp, 70 bls. rags; T. D. Downing & Co., Cameronia, Glasgow, 67 bls. bagging; E. J. Keller Co. Inc., Waukegan, ——, 211 bls. bagging; Van Oppen & Co., Waukegan, Havre, 240 bls. bagging; Keene & Arkus, Waukegan, Calais, 197 bls. bagging; D. M. Hicks, Inc., by same, 49 bls. threads; Banco Coml. Italiane Trust Co., Southern Cross, B. Aires, 28 bls. old canvas; ——, Britannic, Liverpool, 14 bls. rags; J. Cohen & Son, by same, 10 bls. rags; Brown Bros. Harriman & Co., Exporter, Cadiz, 254 bls. hemp waste; A. W. Fenton, Inc., Maria, Trieste, 24 bls. rags; A. W. Fenton, Inc., Black Heron, Rotterdam, 47 bls. rags; E. J. Keller Co., Inc., Black Heron, ——, 80 bls. bagging; E. J. Keller Co. Inc., Excambion, ——, 38 bls. rags; Darmstadt, Scott & Courtney, Excambion, Alexandria, 143 bls. bagging; M. Snedeker Corp., City of Flint, Belfast, 116 bls. paper stock; J. Cohen Son, Deutschland, Hamburg, 11 bls. rags; E. J. Keller Co. Inc., P. Maersk, ——, 28 bls. rags.

OLD ROPE

Irving Trust Co., Waukegan, Calais, 97 coils; Banco Coml. Italiane Trust Co., St. Louis, Bremen, 121 bls.; Banco Coml. Italiane Trust Co., Excambion, Marseilles, 113 rolls; W. Steck & Co., Rotterdam, Rotterdam, 52 coils.

CASEIN

D. C. Andrews & Co., St. Louis, Hamburg, 70 bags; D. C. Andrews & Co., Deutschland, Hamburg, 70 bags.

WOOD PULP BOARDS

Lagerloef Trading Co., St. Louis, Bremen, 567 bls.

WOOD PULP

E. J. Keller Co. Inc., Pr. Roosevelt, ——, 686 bls. wood pulp; Lagerloef Trading Co., Sagoporack, Wiborg, 773 bls. sulphate, 154 tons; Lagerloef Trading Co., Sagoporack, Kotka, 635 bls. mechanical, 127 tons; Lagerloef Trading Co., by same, 130 bls. sulphate, 26 tons; Lagerloef Trading Co., by same, 270 bls. sulphite, 54 tons; Johaneson, Wales & Sparre, Inc., Strassa, Malmo, 1200 bls. sulphite, 200 tons; Bulkley Dunton & Co., Strassa, ——, 500 bls. sulphite, 101 tons; ——, Strassa, Hernosand, 900 bls. sulphite, 150 tons; ——, by same, 960 bls. sulphate, 160 tons; ——, Strassa, Sundsvall, 1375 bls. sulphite; Brown Bros. Harriman & Co., by same, 450 bls. sulphite; ——, by same, 600 bls. sulphate; Johaneson, Wales & Sparre, Inc., by same, 3948 bls. sulphite; ——, by same, 250 bls. sulphite; Brown Bros. Harriman & Co., by same, 900 bls. chemical; ——, by same, 250 bls. chemical; Castle & Overton, Inc., Hamm, Hamburg, 905 bls. wood pulp, 181 tons; E. M. Sergeant & Co., Bergensfjord, Oslo, 150 bls. chemical; J. Andersen & Co., Bergensfjord, Sarpsborg, 600 bls. sulphite; ——, Bergensfjord, Oslo, 2665 bls. sulphite; Castle & Overton, Inc., Deutschland, Hamburg, 275 bls. wood pulp, 55 tons; E. J. Keller Co. Inc., Scanyork, ——, 327 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING NOVEMBER 18, 1933

A. W. Fenton, Inc., City of Flint, Glasgow, 60 bls. paper stock; T. D. Downing & Co., by same, 18 bls. rags; T. D. Downing & Co., by same, 10 rolls print paper; Jay Madden Corp., Hamm, Bremen, 188 rolls news print; Irving Trust Co., by same, 300 bls. wood pulp; Castle & Overton, Inc., Hamm, Hamburg, 980 bls. wood pulp, 252 tons; Stone & Downer by same, 72 rolls news print.

NEW LONDON IMPORTS

WEEK ENDING NOVEMBER 18, 1933

Lagerloef Trading Co., Sagoporack, Wiborg, 2400 bls. sulphate, 501 tons; ——, Sagoporack, Kotka, 2543 rolls news print.

PORTLAND IMPORTS

WEEK ENDING NOVEMBER 18, 1933

Johaneson, Wales & Sparre, Inc., Strassa, Soderhamn, 1486 bls. sulphite, 247 tons; Johaneson, Wales & Sparre, Inc., Strassa, Sundsvall, 1950 bls. sulphite; ——, by same, 600 bls. sulphite; ——, by same, 2500 bls. chemical pulp; Brown Bros. Harriman & Co., by same, 1375 bls. chemical; Tradesmans Natl. Bank Trust Co., Strassa, Norrsundet, 1250 bls. sulphate; Tradesmans Natl. Bank Trust Co., by same, 1500 bls. sulphite; Bulkley Dunton & Co., Strassa, ——, 175 bls. sulphate, 35 tons.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 18, 1933

Castle & Overton, Inc., Waukegan, Havre, 48 bls. rags; E. Mayer, by same, 85 bls. rags; Clinton Paper Corp., Markland, Liverpool, N. S., 2012 rolls, news print; Lagerloef Trading Co., Sagoporack, Wiborg, 771 bls. sulphite, 154 tons; Lagerloef Trading Co., Sagoporack, Kotka, 732 bls. pulp boards, 78 tons; Lagerloef Trading Co., by same, 127 bls. mechanical, 25 tons; Lagerloef Trading Co., by same, 260 bls. sulphate, 52 tons; Lagerloef Trading Co., by same, 725 bls. sulphite, 145 tons; J. W. Hampton, Jr., by same, 189 rolls news print; Bank of N. Y. Trust Co., City of Flint, Belfast, 89 bls. paper stock; Castle & Overton, Inc., City of Flint, Glasgow, 40 bls. rags; Darmstadt, Scott & Courtney, by same, 36 bls. rags; ——, Hamm, Bremen, 186 bls. rags; Philadelphia Natl. Bank, Hamm, Hamburg, 53 bls. rags; Manufacturers Trust Co., by same, 1375 bls. wood pulp, 275 tons; M. Sone, by same, 500 bls. wood pulp, 100 tons; Gottesman & Co. Inc., Grandon, Finland, 600 bls. wood pulp; Gottesman & Co. Inc., Scanyork, Czechoslovakia, 1274 bls. wood pulp; E. J. Keller Co. Inc., Scanyork, ——, 327 bls. wood pulp; E. J. Keller Co. Inc., Exchange, ——, 81 bls. rags; E. J. Keller Co. Inc., Black Hawk, ——, 70 bls. rags.

NEWPORT NEWS IMPORTS

WEEK ENDING NOVEMBER 18, 1933

Johaneson, Wales & Sparre, Inc., Strassa, Soderhamn, 840 bls. sulphite, 140 tons; ——, Strassa, Hernosand, 1500 bls. sulphate, 250 tons; ——, by same, 360 bls. sulphite, 60 tons; Bulkley Dunton & Co., Strassa, ——, 7385 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING NOVEMBER 18, 1933

E. J. Keller Co. Inc., City of Baltimore, ——, 61 bls. rags.

NEW ORLEANS IMPORTS

WEEK ENDING NOVEMBER 18, 1933

Gottesman & Co. Inc., Vasaholm, Sweden, 600 bls. wood pulp.

GALVESTON IMPORTS

WEEK ENDING NOVEMBER 18, 1933

Guaranty Trust Co., Hamm, Bremen, 97 bls. bagging; ——, by same, 122 bls. bagging; National City Bank, Hamm, Hamburg, 118 bls. bagging.

HOUSTON IMPORTS

WEEK ENDING NOVEMBER 18, 1933

Jay Madden Corp., Hamm, Hamburg, 9 rolls newsprint; E. C. Palmer Co., by same, 147 rolls newsprint; ——, Hamm, Bremen, 78 bls. bagging; National City Bank, by same, 81 bls. bagging.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, November 22, 1933

Trading in the local paper market during the past week was light. Now that the President has signed the Recovery Code for the Paper Industry, however, it is confidently anticipated that there will be a revival of demand in the near future. Sales forces of the leading paper organizations may be expected to do their share in the movement for recovery.

The news print paper market continues to show signs of improvement. Consumption in the United States during October was 5 per cent greater than in the corresponding period of the preceding year. The price armistice agreed upon by United States, Canadian and European manufacturers has been extended until November 29.

Production of paper board is being maintained in sufficient volume to take care of current requirements. Demand for box board is fairly persistent. Prices are steady. The fine paper market is displaying strength. Tissues are moving in fairly good volume. No radical changes have been reported in the coarse paper market.

Mechanical Pulp

The ground wood pulp market is generally marking time. Manufacturing operations in North America and abroad are proceeding at a normal pace for the season and the position of the industry is sound. Prices are generally holding to previously quoted levels without difficulty.

Chemical Pulp

Steadiness prevails in the chemical pulp market. While demand for the various domestic and imported grades is only moderately active, offerings are not excessive. Shipments against contract are going forward with regularity. Quotations are steady to firm, in most instances, although currency fluctuations are creating anxiety.

Old Rope and Bagging

The old rope market is very dull at present. Demand for both domestic and imported old manila rope is listless. Small mixed rope is fairly active. Old rope prices remain unchanged. The bagging market is spotty. Requests for gunny and scrap bagging are slow. Roofing bagging is easy.

Rags

Little interest is being displayed by the paper mills in the domestic rag market. Demand for new cotton rags is only fair, with the exception of No. 1 white shirt cuttings, which are holding up well. Roofing grades are softer. Due to the foreign exchange situation the imported rag market is quiet.

Waste Paper

The paper stock market is slightly steadier. Board mill demand for the lower grades is a little better. Recently quoted prices on strictly folded news and No. 1 mixed paper are well sustained. The better grades of waste paper are moving in greater volume, including hard and soft white shavings.

Twine

Conditions in the local twine market are fairly satisfactory. Demand for the various grades is seasonal and supplies are moving into consumption in good volume for the time of year. Despite the usual keen competition for desirable orders, prices are generally well sustained.

PRESIDENT SIGNS PAPER CODES

(Continued from page 13)

cutput would be about 120,000. The effect of the code, however, will be to restore employment to 128,000, the 1929 figure, although the present rate of production is far below the 1929 rate.

The total pay roll of the industry for May, 1933, was at a rate of approximately $100,000,000 a year. The American Paper and Pulp Association estimates that the effect of the code will be to increase the rate to approximately $170,000,000 per year. This estimate is based upon the production of June and July, 1933, and on such data as is available concerning action already taken by many large employers to increase wage rates and reduce working hours under the President's Reemployment Agreement.

Boston Paper Market Dull

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 20, 1933—Business with wholesale paper jobbers was generally quiet during the week, although in one instance, at least, there was a decided improvement, particularly in fine papers, with some very sizable orders coming in, and in another case a slight improvement. Some others report a fair volume of orders. Developments are taking place and some announcements of concerns which will offer new lines of fine paper are expected within a week or two. Wrapping paper was rather quiet, with some dealers stating that business had been poor since the first of the month. With others, only a moderate volume of sales took place. Prices held fairly well. Box board is not particularly active.

In paper stock, the value of goods of foreign origin is uncertain, with the advancing rate of Exchange, and the American buyer will not pay the price, it is stated. Foreign gunny bagging is being offered at 1.70 per hundred weight, which buyers are loath to pay. Domestic paper stock does not show any reaction to advanced foreign quotations, with consumers pursuing the policy of paying the price prevailing for merchandise at the time they need it. The domestic market is quiet, with several grades of waste paper showing weakness. No. 1 kraft declined to 1.00 from a range of 1.05 @ 1.10, No. 1 mixed papers to .22½ @ .27½ from .25 @ .30, print manila to .45 @ .50 from .50 @ .55, old newspapers to .37½ @ .42½ from .42½ @ .37½, and corrugated boxes to .27½ @ .35 from .35. In bagging, mixed strings are down to a flat .60 from a range of .60 @ .70.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 22, 1933.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—Quotations on bleaching powder have been advanced 15 cents per hundred pounds. The contract movement is well up to average for the time of year. Bleaching powder is now quoted at from $1.90 to $2.15 per 100 pounds, in drums at works.

CASEIN.—The casein market is fairly active. Domestic standard ground is quoted at 12½ cents and finely ground at 13½ cents per pound. Argentine standard ground is selling at 15½ cents and finely ground at 15¾ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Firmness prevails in the caustic soda market. Contract shipments are moving in good volume. Solid caustic soda is quoted at from $2.60 to $3.10; while the flake and ground are selling at from $3.00 to $3.05 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is stronger. Prices are being maintained at formerly quoted levels. Imported china clay is selling at from $12 to $17 per ton, ship side; while domestic paper making clay is offered at from $4.50 to $12.00 per ton, at mine.

CHLORINE.—Demand for chlorine is fairly persistent. The contract movement is seasonal. Prices have advanced sharply. Chlorine is now quoted at from $2.00 to $2.25 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is slightly firmer. The grades of gum rosin used in the paper mills are now quoted at from $5.10 to $5.15 per 280 pounds, in barrels, at works; while wood rosin is selling at $4.00 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Steadiness prevails in the salt cake market. The contract movement is normal. Salt cake is quoted at from $14 to $14.50; chrome salt cake at from $13.50 to $14 per ton, at works; while imported salt cake is selling at from $14 to 14.50 per ton, on dock.

SODA ASH.—The soda ash market is displaying strength. Demand from the paper mills is fairly heavy, and the outlook is promising. Quotations on soda ash, in car lots, at works, per 100 pounds, are now as follows: in bulk, $1.10; in bags, $1.40; and in barrels, $1.50.

STARCH.—The starch market is exhibiting a stronger undertone. Shipments against contract are moving regularly. Prices are firm. Special paper making starch is quoted at $2.67 per 100 pounds, in bags; and at $2.95 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Conditions in the sulphate of alumina market are satisfactory. Prices are holding to schedule. Commercial grades are quoted at from $1.25 to $1.46; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market during the past week was along routine lines. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	—
Bonds	6.00	@	—
Index	6.00	@	—
Writings—			
Extra Superfine	6.50	@	—
Superfine	6.25	@	—
Tub sized	5.75	@	—
Engine sized	5.50	@	—
Book, Cased—			
S. & S. C.	5.50	@	—
S. & S. C. Litho.	5.75	@	—
M. F.	5.25	@	—
Coated and Enamel	6.15	@	9.30
Coated Litho	6.90	@	—
Tissues—Per Ream—			
White No. 1	.60	@	.80
White No. 2	.55	@	.70
Anti-Tarnish M. G. only	.75	@	.80
Colored	.80	@	1.00
Kraft	.75	@	.80
Manila	.65	@	.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.11	@	—
No. 2	.10	@	—
Bleached, basis 20 lbs.	.13	@	—

(Delivered New York)

News, per ton—			
Roll, contract	40.00	@	—
Rolls, spot	40.00	@	—
Sheets	45.00	@	—
Side Runs	25.00	@	—
Kraft—			
No. 1 Domestic	4.75	@	5.00
No. 2 Domestic	3.87½	@	—
Southern	3.87½	@	—
Imported	Nominal		
Boards—per ton—			
News	45.00	@	50.00
Chip	42.50	@	47.50
Binders Boards	68.00	@	72.00
Kraft Liner	75.00	@	85.00
Standard 85 Test Jute Liner	50.00	@	55.00
Sgl. Mla. Ll. Chip	52.50	@	55.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	27.50	@	29.00
Dry	28.00	@	29.50

(F.o.b. Mill)

No. 1 Domestic and Canadian	24.00	@	28.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.80	@	3.00
Easy Bleaching	2.15	@	2.30
No. 1 strong unbleached	2.15	@	2.25
Mitscherlich Unbleached	2.15	@	2.25
No. 2 Strong unbleached	2.00	@	2.05
No. 1 Kraft	1.75	@	1.85
No. 2 Kraft	1.60	@	1.70
Sulphate—			
Bleached	2.75	@	3.25

(F. o. b. Pulp Mill)

Sulphite (Domestic and Canadian)—			
Bleached	2.50	@	3.75
Easy Bleaching	2.05	@	2.15
News	1.90	@	2.00
Mitscherlich unbleached	2.25	@	2.50
Kraft (Domestic)	1.60	@	2.75
Soda Bleached	2.50	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.50	@	7.00
Silesias No. 1	4.25	@	4.50
New Unbleached	6.75	@	7.25
New Soft Blacks	3.00	@	3.25
Blue Overall	4.00	@	4.25
Fancy	2.50	@	2.75
Washables	1.75	@	2.00
Mixed Khaki Cuttings	3.00	@	3.25
O. D. Khaki Cuttings	3.75	@	4.00
Men's Corduroy	1.50	@	1.75
New Mixed Blacks	2.50	@	2.75

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	@	3.25
White, No. 2—			
Repacked	1.75	@	2.25
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.25	@	1.50
Black Stockings	2.50	@	3.00
Roofing Rags—			
No. 1	.65	@	.70
No. 2	.50	@	.60
No. 3	.40	@	.50
No. 4	.35	@	.40
No. 5A	.30	@	.35

Foreign Rags

New Rags

New Dark Cuttings	1.50	@	1.60
New Mixed Cuttings	1.60	@	1.70
New Light Silesias	3.50	@	3.75
Light Flannelettes	3.25	@	3.50
Unbleached Cuttings	5.75	@	6.00
New White Cuttings	5.50	@	6.00
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	3.75	@	4.00
No. 2 White Cotton	3.00	@	3.25
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.60	@	1.75
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	1.65	@	1.80
French Blue Linens	2.10	@	2.25
German Blue Linens	1.85	@	2.00
German Blue Cottons	1.50	@	1.60
Checks and Blues	1.30	@	1.40
Lindsay Garments	1.10	@	1.15
Dark Cottons	1.00	@	1.10
Old Shopperies	.85	@	.90
New Shopperies	.80	@	.85
French Blues	1.50	@	1.65

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.30	@	1.40
Domestic	1.25	@	1.35
Wool Tares, light	1.05	@	1.15
Wool Tares, heavy	1.05	@	1.15
Bright Bagging	1.00	@	1.10
Manila Rope—			
Foreign	2.50	@	2.75
Domestic	2.50	@	2.75
Small Mixed Rope	1.10	@	1.35
New Burlap Cut	1.50	@	1.75
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.50	@	2.60
Ordinary Hard White No. 1	2.25	@	2.35
Hard White No. 2	2.10	@	2.20
Soft White No. 1	2.00	@	2.10
Flat Stock-			
Stitchless	.95	@	1.05
Overissue Mag	.95	@	1.05
Solid Flat Book	.75	@	.85
Crumpled No. 1	.60	@	.70
Solid Book Ledger	1.60	@	1.85
Ledger Stock	.95	@	1.05
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.50	@	1.60
New Cuttings	1.10	@	1.20
Extra No. 1 old	.75	@	.85
Print	Nominal		
Bogus Wrapper	.40	@	.50
Container	Nominal		
Old Kraft Machine—			
Compressed bales	1.10	@	1.20
News—			
No. 1 White News	1.10	@	1.20
Strictly Overissue	.60	@	.65
Strictly Folded	.45	@	.55
No. 1 Mixed Paper	.28	@	.33

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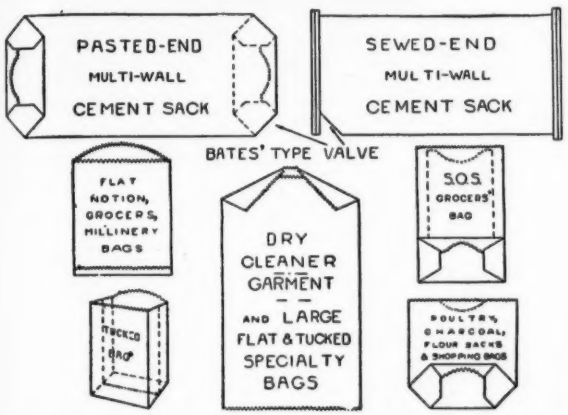

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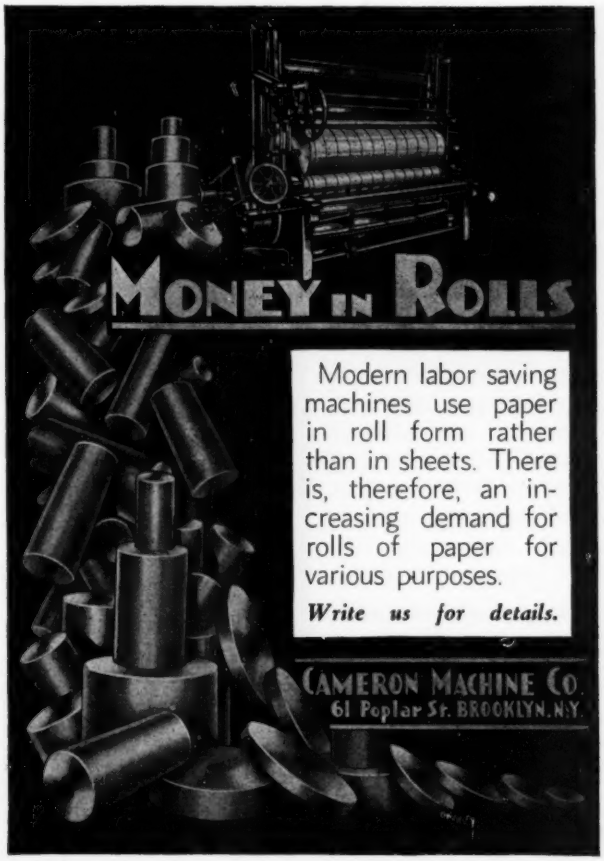
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Twines
(F. o. b. Mill)

Cotton—			
B. C. 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.15½	@	.16½
No. 2	.15	@	.16
Tube Rope—			
4-ply and larger	.09¾	@	.11¾
Fine Tube Rope—			
4-ply	.13¾	@	.14¾
3-ply	.14¾	@	.14¾
2-ply	.15¾	@	.15¾
Paper Makers Twine	.08¾	@	.10¾
Box Twine, 2-3 ply	.12¾	@	.13½
White Hemp	.12¾	@	.15¾
Java Sisal—			
No. 1 Basis	.11½	@	—
No. 2 Basis	.10½	@	—
New Zealand Sisal	.11½	@	—
Sisal Lath Yarn—			
No. 1	.13½	@	.15½
No. 2	.11½	@	.13½
Manila Twine	.24½	@	.29½

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¾
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.04	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.18
No. 1 M. F. Book	.06½	@	.07¾
No. 2 M. F. Book	.05¾	@	.06¾
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¾	@	.05¾
No. 1 Fibre	.04¾	@	.05¾
No. 2 Manila	.04¾	@	.04¾
Butcher's Manila	.03¾	@	.03¾
No. 1 Kraft	3.50	@	4.50
Southern Kraft	2.62½	@	—
No. 2 Kraft	2.62½	@	—
Wood Tag Boards	.04¼	@	.06¾
Sulphite Screenings	.03	@	.03¾
Manila Tie	.07	@	.07¾
White Tissue	.07¾	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	45.00	@	—
Sheets	50.00	@	—
Boards, per ton—			
Plain Chip	37.50	@	—
Solid News	43.50	@	—
Manila Lined Chip	47.50	@	—
Patent coated	55.00	@	—
Container Lined—			
85 Test	60.00	@	65.00
100 Test	60.00	@	70.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.70	@	1.80
No. 1 Hard White	1.40	@	1.50
No. 1 Soft White	1.20	@	1.30
Ledger & Writings	.80	@	.90
Solid Books	.80	@	.90
Blanks	1.00	@	1.05
Krafts	.90	@	1.00
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	1.00	@	1.05
Print Manila	.60	@	.65
Overissue News	.60	@	.70
Old Newspapers—			
No. 1	.55	@	.65
Mixed Papers—			
No. 1	.50	@	.55
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.10
Manila Sul., No. 1	.03	@	.06
Manila No. 2	.03	@	.05
No. 1 Kraft	.05¼	@	.06½
No. 2 Kraft	.03¾	@	.05
Southern Kraft	2.75	@	4.00
Common Bogus	.03	@	.04½
(Delivered Philadelphia)			
News Print Rolls	46.00	@	55.00
Straw Board	40.00	@	45.00
News Board	37.00	@	45.00
Chip Board	40.00	@	45.00
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.03½	@	.04
New White, No. 2.	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft.	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.01½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.30	@	2.40
No. 2 Hard White.	2.10	@	2.15
No. 1 Soft White.	2.05	@	2.10
No. 2 Soft White.	1.15	@	1.25
No. 1 Mixed.	.95	@	1.00
No. 2 Mixed.	.75	@	.80
Solid Ledger Stock.	1.50	@	1.60
Writing Paper.	1.05	@	1.10
No. 1 Books, heavy.	.90	@	1.00
No. 2 Books, light.	.75	@	.85
No. 1 New Manila.	1.20	@	1.50
No. 1 Old Manila.	.85	@	.90
Print Manila.	.75	@	.80
Container Manila.	.75	@	85
Old Kraft.	.90	@	1.05
Common Paper.	.35	@	.45
No. 1 Mixed Paper.	.35	@	.40
Straw Board Chip.	.35	@	.40
Binders Board Chip.	.35	@	.40
Corrugated Board.	.50	@	.60
Overissue News.	.55	@	.65
Old Newspapers.	—	@	.45

BOSTON

Paper
(F o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.20
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05½	@	.11
Rag Content	.12	@	.40
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06¾
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	.05
No. 2 Kraft	.03½	@	.04½
(F. o. b. Boston)			
Southern Kraft	.03½	@	.04½
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¼
(Delivered New England points)			
News Print, rolls	44.50	@	—
Straw Board, rolls	.009	@	35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	45.00	@	50.00
Chip Board	42.50	@	47.00
Chip Board (Creasing)	45.00	@	—
Single Manila Lined Chip	52.50	@	62.50
Single White, Patent Coated News Board—Bender	62.50	@	72.50
Wood Pulp Board	70.00	@	75.00
Binder Boards	62.00	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White.	2.40	@	—
No. 1 Soft White.	2.10	@	—
No. 1 Mixed.	.80	@	.90
No. 2 Mixed.	.75	@	.80
Solid Ledger Books.	1.40	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	1.00	@	1.10
No. 1 Books, heavy	1.00	@	1.10
No. 1 Books, light	.75	@	.85
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.95	@	1.05
White Blank News	1.15	@	1.25
No. 1 Kraft	—	@	1.00
Manila	1.05	@	1.10
No. 1 Mixed Papers	.22½	@	.27½
Print Manila	.45	@	.50
Overissue News	.55	@	.60
Old Newspapers	.37½	@	.42½
Box Board Chips	.32½	@	.35
Corrugated Boxes	.27½	@	.35
Screening Wrappers	.60	@	.70

Bagging
(F. o. b. Boston)

Manila Rope—			
Foreign	—	@	2.25
Domestic	—	@	2.50
Transmission Rope	1.50	@	—
Mixed Strings	—	@	.60
Jute Rope	1.00	@	1.15
Jute Carpet Threads	.65	@	.70
Gunny No. 1—			
Foreign	1.20	@	—
Domestic	—	@	1.00
Bleachery Burlap	3.00	@	3.25
No. 1 Scrap Burlap	1.40	@	—
Scrap Sisal	1.10	@	1.15
Scrap Sisal for shredding	1.15	@	1.30
Wool Tares, heavy	—	@	1.05
New Burlap Cuttings	1.15	@	1.25
Australian Wool Pouches	2.25	@	2.50
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging	—	@	.75
Bagging No. 2	.50	@	.60

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.02	@	.02¼
New White No. 1.	.06½	@	—
New White No. 2.	.04½	@	.05
Silesias No. 1	.04	@	—
New Black Silesias	.02½	@	.03
New Unbleached	.07	@	.07¾
Blue Cheviot	—	@	4.65
Fancy	—	@	.02¾
Washable	.02¼	@	—
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.03	@	.03¼
O. D. Khaki	.03	@	.03¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06¾

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	—
White No. 2—			
Repacked	.01½	@	.01¾
Miscellaneous	.01½	@	.01¾
Twos and Blues	1.25	@	1.50
Thirds and Blues			
Repacked	1.10	@	1.25
Miscellaneous	.85	@	.90
Black Stockings	2.25	@	2.50
Roofing Stock—			
No. 1	.60	@	.65
No. 2	.55	@	.60
No. 3	.35	@	.45

Foreign Rags
(F. o. b. Boston)

Dark Cottons	1.10	@	—
New White Shirt Cuttings	5.50	@	6.50
Dutch Blues	2.00	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.55	@	1.60
Old Linsey Garments	—	@	1.10

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.09¾	@	—
No. 2 Sulphite	.08	@	—
No. 1 Colored	.10¾	@	—
No. 2 Colored	.08½	@	.10½
Ledgers (sulphite)			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.20	@	—
No. 3 M. F. (Carloads)	5.70	@	—
No. 4 M. F. (carloads)	4.75	@	—
No. 1 S. C. (carloads)	6.65	@	—
No. 3 S. C. (carloads)	6.20	@	—
No. 4 S. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.25	@	—
White Wrap	2.22½	@	—
"B" Manila	4.75	@	—
No. 1 Manila	5.25	@	—
Fiber	5.25	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.25	@	—

(F.O.B. Cars Toronto)

News, per ton—			
Rolls (contract)	45.50	@	—
Sheets	50.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	50.00	@	55.00
Sulphate	50.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.10
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.50
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.50
Printed Manilas	.70	@	—
Kraft	1.25	@	1.50
News and Scrap—			
Strictly Overissue	1.00	@	—
Strictly Folded	.70	@	—
No. 1 Mixed Paper	.60	@	—

Domestic Rags
Price to mills f. o. b. Toronto

No. 1 White Shirt Cuttings	.05¼	@	.05½
Fancy Shirt Cuttings	.02¼	@	.02½